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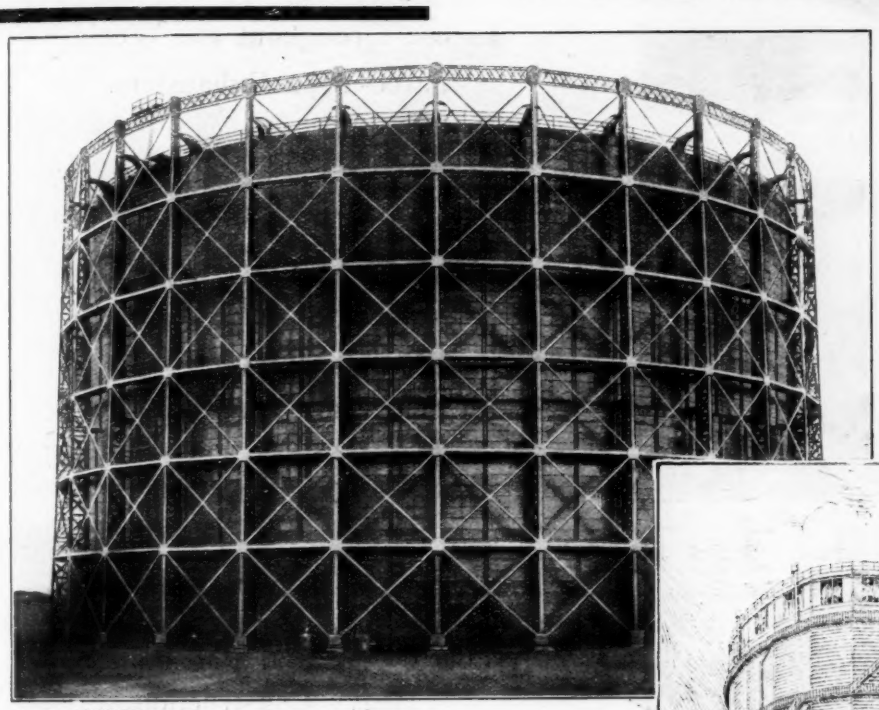

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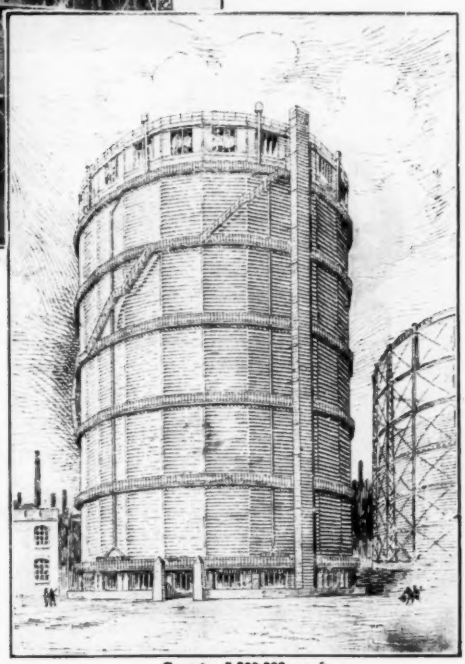

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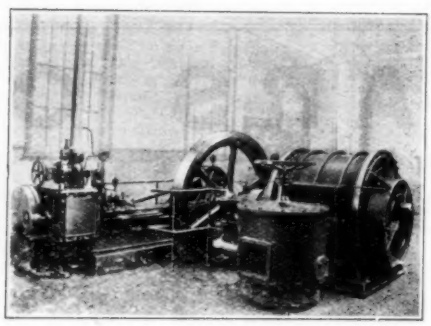

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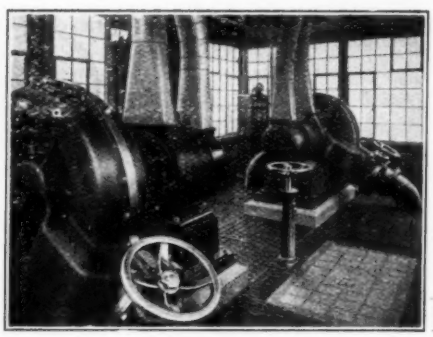

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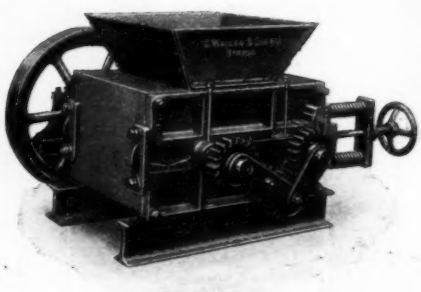

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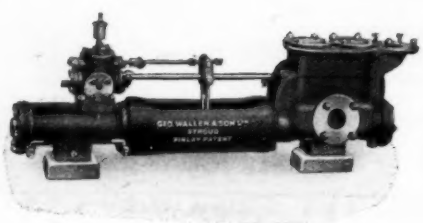

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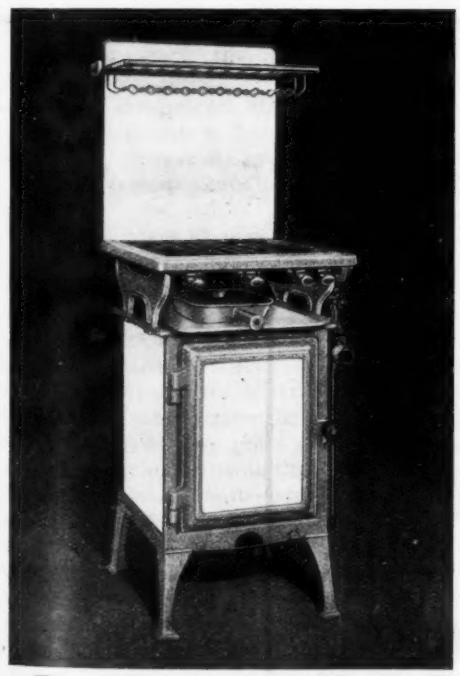

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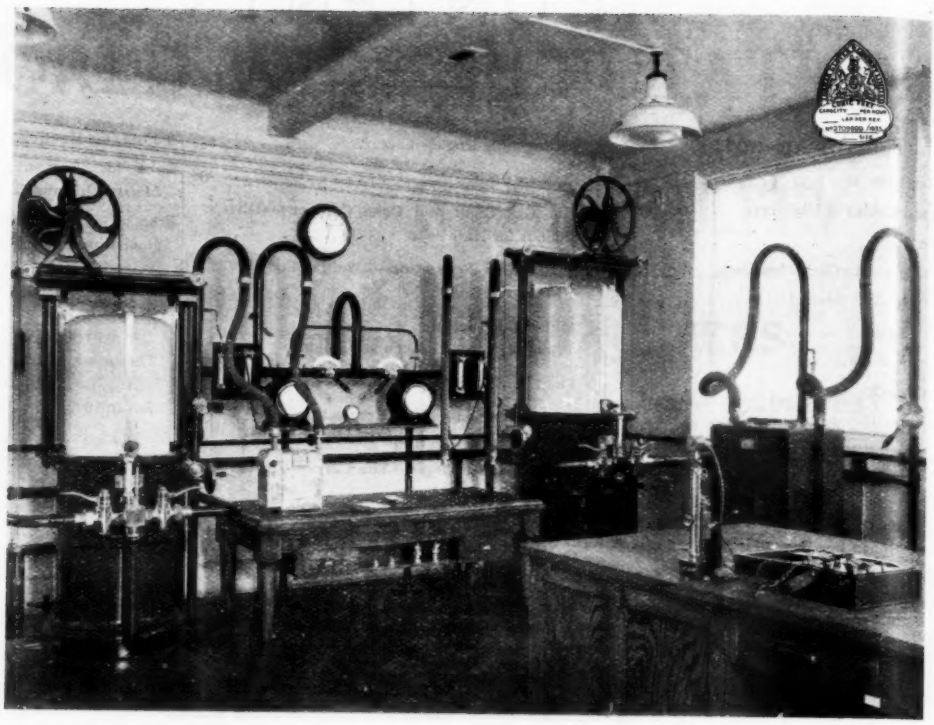

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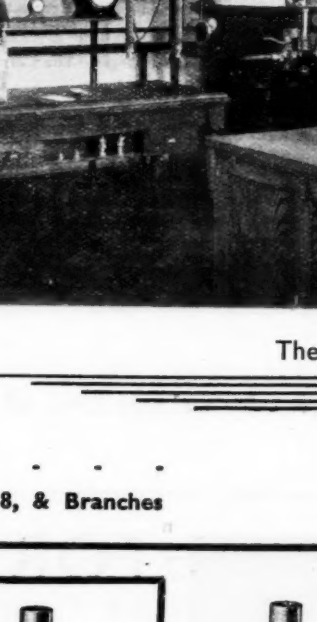

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Gas Journal

JULY 31, 1935

Vol. 211. 87th Year No. 3767

Editorial Notes

Land Drainage Act, 1930

It cannot be disputed that the production of Acts of Parliament is the natural and proper function of the Legislature. It is even less to be doubted that in recent years the Legislature has not fallen behind in this respect.

Members of Parliament may take their summer holidays feeling that so many Acts have been added to the Statute Book, and so, as far as they are concerned, the matter ends. The new Acts, however, although they have ceased to worry the brains of our legislators, are often restless and turbulent children. They may or may not achieve the general objects for which they were passed, but it is certain that they will affect indirectly a great variety of interests and often cause an amount of trouble and inconvenience to industry not foreseen by Parliament.

As an illustration we may refer to the Land Drainage Act, 1930. The principal object of this Act is no doubt wholly commendable as it is essential that land drainage authorities should be organized upon a satisfactory basis. Under the Act Drainage Boards are constituted and these Boards are entitled to levy a drainage rate. Public utility undertakers, already overburdened by income-tax and local poor rates, cannot be expected to greet a new drainage rate with any great enthusiasm. It is therefore particularly unfortunate that the Land Drainage Act does not indicate any basis upon which such a rate is to be based. In the case of ordinary premises, such as factories, shops, dwelling houses, the Act provides that the drainage rate shall be based on the gross Schedule A income-tax assessment. Since 1926, however, public utility undertakers have been assessed not under Schedule A but under Schedule D.

The Act, however, provides that where a hereditament is not subject to Schedule A the assessment for the drainage rate shall be fixed by the Drainage Board. It may possibly be assumed that the Drainage Board will, in assessing public utilities, follow the basis laid down by the Act in respect of other undertakings, and make the assessment on a gross value. What gross value is to be taken? Clearly not the gross rateable assessed under the Rating and Valuation Act, 1925, as this bears no comparison whatever with a gross structural valuation such as would, in the case of ordinary hereditaments, be made for Schedule A purposes. In the past it is understood that a great variety of methods of assessment have been made throughout the country, and such a state of affairs cannot be desirable.

It is satisfactory, therefore, to note that negotiations are taking place between the Conjoint Conference of Public Utility Associations and the Catchment Boards Association regarding the matter, and we believe there is every prospect that some basis of assessment acceptable to all parties will be agreed. Meanwhile, we think that any gas undertakings who have had experience regarding this matter will be doing a service to the Industry if they communicate to others any knowledge they have gained, and the obvious medium for communication is the National Gas Council. We also suggest very strongly that any Drainage Rate assessments be referred to the Council before agreement.

Mains and Cables in Highways

It is much to be regretted that after several years of negotiation between the Associations of the Highway Authorities and the Gas and Electricity Industries, the attempt to obtain an agreed highway Clause which could as a matter of course be incorporated in Private Acts and Special Orders has, at least for the present, broken down. The benefits which all parties affected would derive from such a clause are obvious, and it was anticipated that the highway authorities, no less than gas and electricity undertakers, would realize that agreement could only be achieved in the spirit of "give and take."

While the main responsibility for the upkeep and maintenance of the highways is naturally upon the highway authorities, it is necessary to recognize that public utilities have the no less important task of supplying the amenities of modern life to the public, and for that purpose have been granted by Parliament certain rights over the highways of the country. Further, it is the function of a highway to accommodate sub-surface traffic as well as that which makes use of the surface. It would, therefore, be regrettable if the temporary breakdown of negotiations was followed by an aggressive attitude on the part of highway authorities towards public utilities. Of such an attitude there is unfortunately

some evidence. Statutory undertakers are frequently asked to sign forms, often stated to be permits, prescribing conditions for road opening and reinstatement; highway authorities are tending to seize upon every approach by an undertaking to Parliament to ask for protective clauses containing onerous conditions far in excess of those prescribed by the Gas-Works Clauses Act, 1847. It is therefore desirable that it should be widely known that the Board of Trade will not insert highway protective clauses in Special Orders unless the undertakers applying for the Order have agreed to the clause, or a similar protective clause already exists in the Acts or Orders of the undertakers.

There is no industry in which the corporate spirit is more apparent than in the Gas Industry, and undertakers throughout the country are swift to realize that, although it may in cases be tempting to agree a clause in order to " get the Order through," or sign a form in order to get the job done, such a line of conduct is bound in the long run to be prejudicial to other undertakers and to the whole Industry as well as to themselves. In addition, the multiplication of clauses and agreements would undoubtedly make the resumption of negotiations on a national basis more difficult. It is hoped, therefore, that undertakers will not accept protective clauses in favour of highway authorities without previous consultation with their National Association; and it is also most desirable that no form of agreement should be signed without similar consultation.

Oil from Coal

In the House of Lords last week the Duke of Montrose asked the Government several questions about the production of petrol from coal, in particular whether they contemplated taking any further steps to expedite the production of oil and petrol from home sources. All that was needed, he added, was for the Government to say that they would guarantee the interest on capital expended in putting up coal distillation plants. Two million pounds would provide ten plants capable of putting out 21,000,000 gallons of oil, giving employment to some 5,000 men. In reply the Earl of Munster said that from 1931 to 1934 the total output of motor spirit from coal rose from 38,000,000 gallons to 52,000,000 gallons; and there appeared to be no lack of vision on the part of the Government when the production of motor fuel had increased by so large a percentage. He pointed also to the new tax on imported fuel oil for use in road vehicles, which, he suggested, should encourage efforts to produce from indigenous material a suitable fuel for diesel engines. Such fuel was exempt from the tax.

We have before us the First Report of the " Oil from Coal " Committee of the Scottish National Development Council. The Duke of Montrose is a member of the Committee, and he puts forward a supplementary statement to the report. He maintains that too much stress has been laid on the purely petrol aspect of coal treatment, and that there is little likelihood of hydrogenation plants, costing over £4,000,000 each, being erected in Scotland solely for the purpose of producing petrol from coal. Fully twenty low-temperature carbonization plants could, he states, be erected for the same money, and they would spread employment and create subsidiary industry much more effectively. " In the interests of National Defence, and with the object of doing something practical to remove unemployment, low-temperature carbonization would seem to have a special claim for Government support. . . . I therefore feel my colleagues might have approved some such recommendation as that the Government be approached to grant a guarantee of 4% interest upon capital invested in low-temperature carbonization plants to be erected in Scotland, and the said guarantee to be limited to £1,000,000. The guarantee to be restricted to ten years' duration." In the House of Lords, it will be noted, the Duke of Montrose added another £1,000,000 for luck. That, however, is beside the point.

Low-Temperature Carbonization

What does concern us very much indeed is the extraordinary appeal of low-temperature carbonization to the public. Millions of pounds have been lost in various low-temperature carbonization processes. On the other hand, there have been great developments; the technique of low-temperature carbonization is now much more fully understood and the economic position more clearly viewed. But this Government guarantee business is becoming a plague. Were the Government to acquiesce in any such plan as that proposed by the Duke of Montrose, an injustice would, not for the first time, be done to the Gas Industry. Supporters of the scheme would, however, and with a certain amount of justification, say that in general the Gas Industry had in the past paid little attention to the domestic solid fuel market—that they had not set themselves out to cater for an obvious public demand, a free-burning smokeless fuel for the domestic open firegrate. For long we have urged our Industry to do more in this direction, and we are gratified, if not satisfied, with what has been done during the past few years and is being increasingly accomplished at the present. Even now, however, the Industry is not sufficiently exercised about developments which are taking place all around. To our mind the Gas Industry should be the smokeless fuel industry of Great Britain. If it is not very careful it will find itself hampered in its future solid fuel business. Moreover, this encroachment will not be in the nation's best interests, for any process of carbonization can best be worked in conjunction with a gas-works which can provide a market for the gas produced.

We thoroughly appreciate the Gas Industry's point of view that, from a gas-making aspect, its present process is the most remunerative when regarded in terms of per unit of gas sold. This idea, however, should not be allowed to eclipse another way of looking at the operations of a gas-works, which is simply to consider the annual net profit on the sale of smokeless fuels, both gaseous and solid. If the sale of solid smokeless fuel shows an adequate profit, it does not seem to matter to us what amount of gas is produced or how it is credited in the balance-sheet. That is, of course, if the Industry wishes to be a complete smokeless fuel industry. And apart from low-temperature carbonization there are other means of producing satisfactory smokeless fuel for use in the open firegrate. In our pages last week Mr. John Roberts expressed the idea that a modern gas-works could employ, besides low-temperature carbonization and high-temperature carbonization, two systems of medium-temperature carbonization, one fast coking and the other slow coking.

In connection with this idea, we suggest study of the report of the " Oil from Coal " Committee to which we have referred, and which is published by the Scottish National Development Council. The report, which is a preliminary one, appeals to us as being well balanced. There is nothing particularly startling about the report, but it is an interesting analysis of the present situation. It commences on the usual basis that the aim is to displace the 40 million tons of coal used for domestic pur-

poses by smokeless fuel. This, it is assumed, implies an input of coal into the retorts of about 60 million tons. Considering the proved greater efficiency of smokeless fuel over raw coal, this figure is to our mind on the high side. However this may be, it is obvious that straight low-temperature carbonization, helped by the massed resources of the gas and coke oven industries, cannot do a great deal to supplant imported oil. The figure given is 19% of the total consumption of motor spirit. This analysis should serve to check the tendency to exaggerated statement. On the other hand, from a technical point of view, if all the tar yielded by the processes were linked with hydrogenation, then the amount of motor spirit which could be produced would satisfy present needs. At the same time, the hypothesis on which the calculations are based requires, as we have said, 60 million tons per annum of coal suitable in regard to ash content and other properties for low-temperature distillation, and it is very doubtful whether such a quantity could be made available.

High-Grade Coal Needed

Discussing the characteristics of smokeless fuels, it is observed that electricity warms; gas warms and ventilates; a coal fire warms, ventilates, and entertains. This "entertainment" is closely associated with the character of the ash. "Some smokeless fuels are made from coal less than ½ in. in size or from pulverized coal which is insufficiently clean, and it is when those fuels have been burning in a room grate for an hour or two that the chief drawback of the fuel becomes only too obvious; the ash smothers the fire. Unless carefully poked to make the ash fall through, the mass of burning coke becomes coated with a monotonous covering of grey or brown powder." In this connection reference is made to the work of the Chemical Department of the South Metropolitan Gas Company as reported in the publication "The Solid Products of the Carbonization of Coal," which was the subject of comment in these columns last year. The experiments referred to were carried out on semi-coke made from nut coal containing no material below ¼ in. in size and from coal altogether below ¼ in. The ash of the latter fuel was more or less uniform in colour, and when the fuel was burnt on a fire the appearance was monotonous and dusty. The fuel made from coal above ¼ in. gave a much pleasanter appearance on the fire. The essential difference between these two types of ash was neither the weight nor the volume but the fact that one possessed relatively large pieces of contrasting colour, and this contrast was sufficient to remove the appearance of ashiness. It was concluded that for the production of satisfactory low-temperature coke the use of small coal or finely crushed coal must be limited.

Now the Committee mention that one of the claims made by supporters of low-temperature carbonization is that it will enhance the value of low-grade coal, and so allow of a good price being realized for material that is almost a drug on the market. The coal they usually have in mind has a high percentage below ¼ in. and contains 8 to 12% of ash. The semi-coke, unless cleaned, would contain 11 to 16% of ash and be unsaleable for house purposes. The Committee, as a result of tests of smokeless fuels in their own homes, arrive at the conclusion that, instead of a smokeless fuel being derived from low-grade coal, an especially high-grade coal will be required if the semi-coke is ever to be a formidable competitor of good house coal in a free market. The Committee make the following recommendations: If the coal as charged is of a size not smaller than 1¾ in. an ash percentage may be allowed up to about 4·5% in the semi-coke (or rather more than 8% in coal). If the coal as charged is of a size smaller than 1¾ in., the ash in the semi-coke should not exceed 3·5%, or about 2·5% in the coal. If the coke is made from coal that does not agglomerate and involves briquetting, and is subjected after carbonization to a cleaning process preceding briquetting, the ash in the briquettes should not exceed 3·5%. These are stringent requirements, and it is possible, as suggested by Dr. Grumell, of Imperial Chemical Industries, that the coal industry may have to consider the preparation of "pure coal" containing not more than about 2% of ash. The report emphasizes that to get a suitably pure material with which to feed the retorts is of fundamental importance if smokeless fuel is to be produced in bulk. The cost of obtaining that material by the methods available, and outlined in the report, should be closely investigated.

"Luxury Prices"

Semi-coke is being sold readily which contains more ash than the suggested limits stipulate, but the sale is a mere drop in the ocean. To quote the report, "the fact that 4,000 tons a year of coalite is reported to be sold in Scotland at £3 a ton provides no reliable basis for calculating the price which 1,000,000 tons a year would fetch. . . . We are concerned much less with the present luxury prices than with the price the fuel might realize in Scotland in the event of the industry becoming important, and we suggest that it would be highly injudicious to base calculations on prices that are now being obtained, and particularly on those obtained in London." The Committee consider it advisable to gain more definite information on the demand for smokeless fuel in Scotland, and suggest that some hundred tons of Scottish coal, with an ash content complying with the foregoing specification, should be carbonized at a low-temperature plant and submitted for sale through representative coal distributing agencies.

The report gives two estimated balance-sheets for low-temperature carbonization plant—one externally heated retorts, the other internally heated rotary retorts. We are not so much concerned with the actual figures of these estimates as with the emphasis in the report that whether the coal be coking or non-coking, the revenue from carbonization is enhanced if the plant is connected with a gas undertaking. For externally heated retorts, the extra revenue, due to giving a net credit for the gas produced of ½d. a therm, may, it is stated, amount to 2s. 6d. per ton of saleable smokeless fuel; while a larger revenue from the sale of rich gas, amounting to about 5s. 6d. per ton of saleable smokeless fuel, could be allowed if carbonization were effected at medium temperatures in retorts externally heated by producer gas. The Committee observe—and it is an important observation: "It appears that circumstances may exist under which straight low-temperature carbonization would be a commercial success. We find, however, that under current conditions any system of low or medium temperature carbonization operating in Scotland on a large scale and depending mainly for its revenue on the sale of smokeless fuel is more likely to succeed if it produces a quality of gas suitable for a gas undertaking and is connected with such an undertaking or with a gas grid." As far as processes involving the retorting of coal-oil blends are concerned, the Committee simply recommend that they undergo test by the Director of Fuel Research. Indeed, all low-temperature processes should be tested by the Director of Fuel Research before the public is invited to provide any part of the capital.

Back to the B.I.F.

THERE will be considerable satisfaction in many quarters with the decision of the Gas Industry to return to the Castle Bromwich Section of the British Industries Fair next year, after an absence of one season. This was largely due, of course, to the experiment of holding the heavy industries section of the Exhibition in May instead of February as in previous years, which was considered a time of year totally unsuited to the staging of a large-scale, composite gas display. The Fair authorities have now reverted to the more usual date, which makes possible the return of the Gas Industry in force, and it is safe to assume that they will be very pleased to see us back. If we might drop them a hint on this occasion, it would be to remind them—though we are sure this will not be necessary—of the welcome once accorded to a prodigal son on his return. We are not proposing to pose as prodigals, but none the less most of us appreciate the fatted calf on occasions.

The authorities have always treated us, as indeed all their exhibitors, with the greatest consideration and courtesy, and there is actually little they can do in the way of calf slaughter which they have not always done. We feel sure, however, they will give every assistance to our own Committee in enabling us to make a fresh start with a really well-planned block. The old exhibit, as is often the case with a community which has grown and developed by degrees, perhaps had certain small defects in its accommodation, and the present occasion will be ideal for eliminating them by a thorough-going town-planning system. This will require careful thought on our own part, and sympathetic consideration by the Fair authorities. We feel certain it will have both, and that the result will be a forceful and dignified representation of the Gas Industry as a leader among British industries.

It remains only for us to record the gratitude which is universally felt to the contracting side of the Industry. From the very nature of the Exhibition they cannot expect a direct return of even a minute proportion of their expenditure, but they have loyally co-operated, through their representation on the British Gas Federation Exhibitions Committee, in ensuring that gas shall resume its place in this comprehensive display of British industry now that the change of date has once again made it possible. It is interesting to note that the gas section will stand in the name of the British Gas Federation, and this fact should ensure every possible support, in attendance, publicity, and every other way, of the efforts of those who will be bearing the burden of the day.

Coke Research

WE publish to-day a Report by Mr. J. E. Maconachie (Gas Research Fellow) and Mr. C. Tasker (Research Fellow in Fuels) of the Ontario Research Foundation, in which the authors discuss the relations between the physical and chemical properties of coke and its firing characteristics in domestic furnaces. It is good to note the way in which the problem of the efficient preparation and utilization of coke is being tackled in Canada, and the contribution rightly emphasizes the importance of uniformity of delivery of coke and correct and careful sizing. Cutting and grading of coke have been largely responsible for the growth in the popularity of coke in this country, and there can be no doubt that extension of the practice in Canada will have the same satisfactory result.

It is also good to note from the Annual Report of the Northern Coke Research Committee for 1934 that increased interest in the work of the Committee was maintained throughout the year and that collaboration with the Midland and Scottish Coke Research Committees and other research organizations continued to be an important feature of the activities. The Report refers to a new method which has been devised of comparing the nature of the carbonaceous substance of coke by "wet oxidation." The method consists in determining the rate of carbon dioxide formation by oxidizing a graded sample of the coke with a mixture of phosphoric and chromic acids at 100° C. The results obtained are remarkable in that the chemical reactivities of cokes determined by this method are the inverse of those to be expected on the basis of existing methods involving gas reactions. For example, electrode carbon and graphite, normally considered to be relatively unreactive, were found to be about ten times more reactive than low-temperature coke, which was itself more reactive than sugar charcoal. High-temperature cokes were more rapidly oxidized than gas cokes and low-temperature cokes. A survey of the rates of oxidation determined by this method for a number of cokes from several coalfields showed that the order of the rates of oxidation was, in general, closely similar to that of the generally accepted metallurgical reputations of the cokes. Investigations at present in progress indicate that graphite and highly graphitized forms of carbon are oxidized more readily than the so-called "amorphous" forms of carbon.

Tottenham's Expansion

WE reported last week the proceedings before the Director of Gas Administration in connection with the Draft Order of the Tottenham District Gas Company which carries its scheme of amalgamation and expansion one important step farther. It is common knowledge that the Tottenham Company has, during the past few years, been pursuing a quiet policy of expansion by acquiring various Companies whose areas are in close proximity to its own. This process actually started as far back as 1913 when the Enfield Company was taken over. In 1928 the Waltham and Cheshunt Company was acquired, and in 1932 followed the Hertford, Hoddesdon, and Ware Companies. All this was taking the Tottenham Company considerably afield from its original area of Tottenham, Edmonton, and Hornsey—Hornsey now being a separate Company, however. It will also be remembered that in 1913 Tottenham acquired the Wood Green Electric Lighting Order which was granted to the Wood Green Urban District Council in 1902. The subsequent re-sale of this released cash which no doubt rendered more easy for the Company a pursuance of their admirable policy of acquiring other small gas companies operating in contiguous areas. Therefore, in October, 1932, the share capital of the Hitchin Gas Company was purchased; and in 1934 the Biggleswade Company was dealt with in the same manner after the non-statutory Stevenage and Shefford Companies had been acquired on the basis of purchase of the capital. Thus the Tottenham Gas Company became possessed of a very large area which was added to in March of this year by the same operation being applied to the Dunstable Gas Company.

The object of the Draft Order which was the subject of the enquiry last week was to give Parliamentary effect to the purchase of the Hitchin, Biggleswade, Stevenage, and Shefford Companies. The Dunstable purchase was made after the Order had been deposited, and so for the moment the Tottenham Company will have the controlling interest in and management of that Company without the area being, in the Parliamentary sense, a part of the Tottenham Company's area.

Strange Opposition

THESE may be regarded as the bare facts of the proposals which have been placed before the Board of Trade, but there is an interesting point in connection with the various differentials which must of necessity be imposed in such an area. The Chief Engineer of the Company—Mr. H. C. Smith—has perforce been very carefully into this matter, and has arrived at differentials which in some instances practically depend for their success on an increased sale of gas in the areas. But it is here that the complexities and idiosyncrasies of our system of local Government made themselves manifest. For all practical purposes there was no opposition to the Order, but we were presented with the spectacle of conflict of opinion between an urban district council and a county council. This is a state of affairs which has been very prominent in recent years, and has been responsible in no small degree for the passing of the Local Government Act of 1929 under which there is now proceeding a readjustment—drastic in some cases—of area, especially of the smaller local bodies, the object being to reduce the numbers of the latter wherever possible. At the present moment we have parish councils, rural district councils, urban district councils, boroughs, county boroughs, and county councils all operating within the counties, and on occasion they are not backward in making known their opinions of one another—not always complimentary. Be that as it may, we have all these bodies within one county area looking after the interests of the public, with the county council exercising a sort of overriding supervision often to the annoyance and irritation of the component authorities, and often with an overlapping and even contradictory viewpoint. This we saw in the case of the Tottenham Order, for whereas the Middlesex County Council opposed on the ground that the 5d. differential in the case of Biggleswade was too low—presumably from the fear that the consumers elsewhere would suffer—the Biggleswade Urban District Council opposed from the very opposite point of view—viz., that the differential was too high.

One other reflection on this matter. Watching municipal activities in various spheres such as gas, electricity, and water supply, how often do we find members of local governing bodies urging the need for the long view and the spending of capital in advance of requirements, together with criticism that public utility companies are backward in their outlook. Indeed, this allegation is constantly used to reinforce the argument in favour of municipalization and nationalization. Actually we have little or no concern with the respective merits of municipal and private trading, but it is impossible not to comment when one sees what happened in connection with the Tottenham Order. True, the opposition was of a very mild character. The Middlesex County Council admitted it was not in a position to challenge the differentials in detail but, taking the line of least resistance, placed the onus upon the Company to justify them, while much the same position was adopted by the Biggleswade Urban District Council. The proceedings were admittedly of the most friendly character and presumably in their position as trustees for the public the governing bodies in question felt justified in their action. On the other hand, here is a gas company endeavouring to serve the public in the best possible way by adopting a most go-ahead policy, and fixing differentials the success of which largely depends upon increasing the sale of gas. being challenged—again we emphasize in a mild and friendly manner—with proceeding on lines which were suggested to be ahead of economic considerations, so far as the Middlesex County Council was concerned, and presumably, on the contrary in the view of the Biggleswade Urban District Council, insufficiently progressive. Probably in the end the two will cancel each other out, but judging from the nature of the case put forward by both these opponents it hardly seemed to justify, in our opinion, bringing together, even for the half day during which the enquiry lasted, the Director of Gas Administration, his Assistants, an eminent King's Counsel, the Parliamentary Agent, the Chief Engineer and the Secretary of an important Gas Company, to say nothing of the time which had to be expended by those representing the two opponents.

Correspondence

More "Spoon-Feeding" for the Grid Required

SIR,—In an article in a recent issue of *The Times* entitled "Electricity on the Farm" the following appears:

> The Grid was never intended to benefit the rural areas *per se*, and never can without the further help of the State.

I would call your attention to the word "further."

From the farmer's point of view, both as an agriculturist and a taxpayer, he can obtain a more economical supply of electricity by installing an oil engine and a small dynamo than from the Grid.

Yours, &c.,
D. H. HELPS,
Engineer and Manager.

Gas-Works, Reading,
July 23, 1935.

Personal

On Wednesday, July 17, the Annual Meeting of the International Executive Council of the World Power Conference was held at the Royal Netherlands Institute of Engineers, The Hague. The most important business was the election of a successor to the late Mr. D. N. Dunlop, Founder of the Conference, and Chairman both of the International Executive Council and the British National Committee from the beginning, who died on May 30. Sir HAROLD HARTLEY, C.B.E., F.R.S., Chairman of the British National Committee, was elected by the Council as its Chairman. Sir Harold Hartley is Chairman of the Fuel Research Board and a Director of the Gas Light and Coke Company.

* * *

Mr. F. N. GREEN, who has been a student for the past four years at the City and Guilds Engineering College, South Kensington, has been awarded the Diploma for Associate of the City and Guilds Institute and the degree of B.Sc.(Eng.). Mr. Green is the son of Mr. J. Green, Engineer and Manager to the Wisbech Water Works Company and Wisbech Lighting Company.

Obituary

The death occurred recently of Mr. JOHN MCDONALD, who, previous to his retirement 14 years ago, was for 36 years Engineer and Manager of the Denny and Dunipace Gas Department. He was 85.

* * *

The death took place on July 24 of Mr. JAMES DONALDSON, of Dunbar, who for several terms was Gas Convener and a member of the Town Council.

Forthcoming Engagements

August.

13.—IRISH ASSOCIATION.—Annual Meeting, Jury's Hotel, Dublin.

Sept.

5.—B.C.G.A.—Yorkshire District Conference at Bradford.

9-12.—ASSOCIATION OF PUBLIC LIGHTING ENGINEERS.—Twelfth Annual Meeting and Conference in London.

12.—NORTH BRITISH ASSOCIATION.—Annual Meeting at St. Andrews.

19.—WALES AND MONMOUTHSHIRE ASSOCIATION.—Autumn Meeting at Porthcawl.

19.—S.B.G.I.—Council Meeting at 11 a.m.

28-Oct. 1.—B.C.G.A.—Annual General Meeting and Conference at Edinburgh.

News in Brief

A Reduction of one penny per 1,000 cu.ft., thus reducing it to 3s. 5d. per 1,000 cu.ft., has been recommended by the Directors of the Cupar Gas Company.

An Interim Dividend of 2½% actual on the ordinary stock for the six months ended June 30, 1935, has been declared by the Directors of the South Metropolitan Gas Company.

Applications are Invited by the Buckie Gas Light Company, Ltd., for the position of Engineer and Manager at a salary of £350 per annum with free house, light, and fuel. Further particulars will be found in the advertisement columns of this issue.

Silver Medals were awarded by the Royal Sanitary Institute at the Health Exhibition, Bournemouth, 1935, to the Bournemouth Gas and Water Company for gas appliances for domestic use and to Sidney Flavel & Co., Ltd., for the Flavel "Kabineat."

The Price of Gas to slot meter consumers in Hawick is to be reduced by 5d. per 1,000 cu.ft., and to ordinary consumers by 1d. per 1,000 cu.ft. This was decided at the annual meeting of shareholders of the Hawick Gas Company, Ltd., held at Hawick on July 26.

Dividends in respect of the half-year ended June 30, 1935, will be paid by the Directors of the Croydon Gas Company on Sept. 1 next, at the following rates % per annum, less income-tax: Redeemable preference stock, 7½; maximum dividend stock, 5; sliding scale stock, 7.

A Marked Increase in the imports of tar and bitumen mixture into the Irish Free State is shown by the return for the five months ended May 31. The imports total 67,825 cwt. valued at £15,094 as compared with 30,340 cwt. valued at £7,757 in the corresponding months a year ago.

Independent Gas Company, Ltd., 167, Moulsham Street, Chelmsford, Essex, was registered as a new private company on July 17 with a nominal capital of £1,000, for the purchasing and distribution of butane gas, &c. The Directors are Messrs. P. Yolland-Edwards and D. M. Davies.

The First Public Compressed Gas Filling Station in Germany for the re-charging of the cylinders of industrial motor vehicles operated by town gas has lately been opened in Hanover. The station is equipped with an electrically-operated compressor which delivers gas at a pressure of 200 atmospheres.

Dividends in respect of the half-year ended June 30, 1935, have been declared by the Tottenham and District Gas Company at the following rates all less income-tax and payable on Aug. 9: 5% preference stock 5% per annum, 5½% preference stock 5½% per annum, and ordinary stock 6¾% per annum.

Work Has Been Commenced on the National Coke and Oil Company's new plant in Trafford Park, Manchester, and it is hoped that it will be in full production by the end of the year. The plant will produce 3,000 gallons of petroleum a day from local coal which will be required at the rate of 1,000 tons a week.

Over 250 Appliances per Week are being fitted by the Edinburgh Gas Department. This very satisfactory announcement was made at a meeting of the Edinburgh Public Utilities Committee on July 19 where it was also stated that the output of gas for the month of June shows an increase of 5% over the corresponding month of last year.

French Industrial Lighting.—The French Association des Ingenieurs de l'Eclairage, of Paris, has recently appointed a special Commission of Industrial Lighting to deal particularly with the problems of factory and workshop lighting. One of the first duties of the new body will be that of studying, in conjunction with representatives of the French Office Technique de l'Imprimerie, the lighting of large printing establishments with the object of eventually drawing up a series of standard suggestions with regard to the lighting of such premises.

Out of the 1,000 Balloons provided for the Hospital Fête, and sold in the Jephson and Pump Room Gardens by employees of the Leamington Priors Gas Company, 114 labels have been received at the Gas-Works, filled in with a note as to where the balloons attached to them have been found. The winning balloon was picked up at Batcombe, 16 miles south of Bath and about 70 miles from Leamington.

An Increase in the Price of Gas has been announced by the Haslingden Union Gas Company. An extra 5d. per 1,000 cu.ft. will now be charged to all consumers. To householders the price becomes 3s. 9d., to large consumers 3s. 7d., and for street lighting 3s. 5d. Haslingden Cotton Manufacturers' Association has decided to seek an interview with the Company relating to the new charges and the Town Council have decided upon a similar step.

A Visit was Paid by the members of the North of Scotland branch of the National Association of Local Government Officers to the Inverness Corporation Gas-Works at Manse Place recently on the kind invitation of Mr. Andrew Thomson, Engineer and Manager. After ascending the waterless gasholder the members were conducted over the Works by Mr. Thomson who explained in an exhaustive and lucid manner the various processes employed in the manufacture of gas and its residual products. After the inspection tea was served in the Department's showroom.

The Centenary of the Dungannon Gas Company, Ltd., was celebrated this month. The Company was formed in July, 1835, for the purpose of lighting the town and suburbs with gas. The streets were first lit by oil in 1775 when the Parish Vestry was responsible for the town lighting. In 1856 the Company was reconstructed under the title of "The Dungannon Gas Company," and in 1899 it became a limited company. The present Directors are Mr. James Dickson, D.L., Mr. Alexander Smyth, Mr. W. J. Anderson, and Mr. Edward O'Neill. The Company is the largest rate-paying concern in the town. In post-war times the output of gas has been doubled.

The Gas Light and Coke Company

Dividends for Half-Year

The Directors of the Gas Light and Coke Company have declared dividends for the half-year ended June 30 last as follows:

On the 4% consolidated preference stock at the rate of £4% per annum.
On the 3½% maximum stock at the rate of £3 10s.% per annum.
On the ordinary stock at the rate of £5 12s.% per annum.

The Directors announce that they have had encouraging evidence of improved trade in the past half-year in the area served by the Company.

There has been an increase of 13,000 consumers and the output of gas appliances is the largest total recorded for the first six months of any year, the increase in gas cookers being particularly striking. There has, further, been an increase in the number of public gas lamps, making the Company's total in and around London 50,000.

A remarkable feature of the Company's business in recent weeks has been the great and growing public demand for gas refrigerators, the numbers of which have been increased more than tenfold since the beginning of May.

British Gas Federation

Live Publicity for Industrial Gas

Through the active co-operation of the Industrial Centres, a most impressive exhibit of industrial gas plant is being staged at the Shipping, Engineering, and Machinery Exhibition from Sept. 12-28 under the ægis of the British Gas Federation. A really representative collection of appliances will be on view and actual demonstrations will be carried out on most of them.

The stand occupies a space of about 90 ft. by 70 ft. in a good position in the gallery. The main exhibit is an extensive heat treatment shop in full working order.

Demonstrations can be carried out in oven and muffle furnaces of various types and sizes at all temperatures up to those used for the hardening of high speed steel. In addition to an ordinary high speed steel furnace one fitted with the Sheffield patent atmosphere control will be shown. A range of metal-melting furnaces will be on view and a plastic moulding press and a press for hot brass stampings will be shown at work. Other working exhibits include an oxy-coal-gas profile cutting machine, metal spraying pistols, automatic gas engine driven generator sets, a degreaser, a series of glass blowing burners, and a range of drying ovens.

Steam boilers, central heating boilers, miscellaneous burners, and auxiliaries will add to the general interest, while a wide range of temperature recording and control gear will be fitted to the working exhibits.

Gas engineers should arrange to bring parties of consumers and prospects to see the exhibition. Further information can be obtained from any Industrial Centre.

Athletic and Social

Sports Records Broken at Plymouth.

Several records were broken and new ones set up by members of the staff of the Plymouth and Stonehouse Gaslight and Coke Company on the occasion of the Annual Sports at Longbridge on Saturday, July 13. The high jump record established in 1932 was easily beaten by G. Pengelly with over 5 ft., while G. Ferris set up a new record for the long jump championship with 19 ft. 1 in., and E. Elliott created a new time of 27·7 seconds in the 220 yards handicap. The championship cup given by the President, Col. R. L. Norrington, was again won by the Works Department with 32 points, the offices being runners-up with 19 points. The day workers' team won the tug-of-war. The prizes were distributed by Mrs. G. H. Bolton, wife of the Secretary to the Company. A programme of music was provided by the band of the Devon and Cornwall Royal Artillery.

The New B.C.G.A. Studio

Owing to the great increase in the activities of the display staff at Grosvenor Gardens, due to the progress that has been made in general publicity, that section of the B.C.G.A. had far outgrown the former accommodation at No. 28. A normal year's work is hard enough, but during the last three months the turnover has been greater than

A Busy Scene at the Studio.

in the best previous year. The magnitude of the work of the Association may be gauged to some extent from the fact that they often receive requests from overseas for particular displays. The Silver Jubilee celebrations also have in no small measure been responsible for this phenomenal increase in the demand for advertising material.

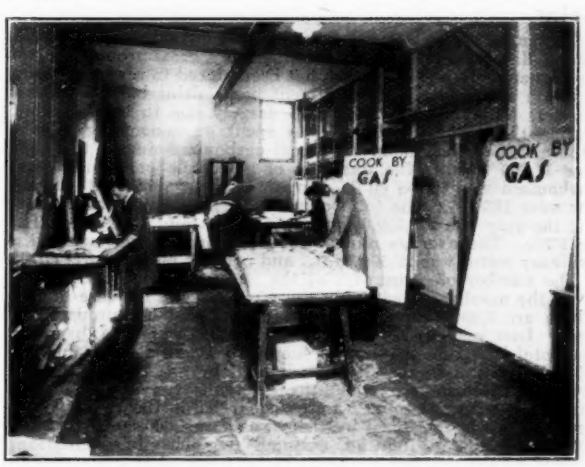
A fortnight ago the Association moved into premises which they have acquired in Grosvenor Gardens Mews North for their Display Staff under the direction of Mr. W. R. Oliver, Display Officer, and on Friday, July 26, members of the Press were privileged to inspect the premises. The visitors, after being welcomed by Mr. W. D. Rowe, Manager of the B.C.G.A., were conducted on a tour of the building by Mr. Oliver.

An entertaining ten minutes were spent in watching Miss N. Harrison executing lightning crayon sketches of a humorous nature and coupling them with piquant "gas" slogans. This type of publicity is proving extremely popular at exhibitions and shows, and we understand that the Association intend to extend its use in the future. The activity that was much in evidence at the studio bore ample testimony to the service that the Association is rendering to the Industry on the sales side. Every endeavour is being made to enter realms of publicity as yet unexplored by our competitors, and present advertising that is both arresting and novel. Posters of a modern and sales compelling type were to be seen during the tour of the studio.

A standard portable exhibition stand with a demonstration dais that can be arranged to suit the exhibitors' requirements is now in the model stage and excited a deal of interest. This stand is to be loaned to member undertakings to be used at local exhibitions in conjunction with suitable advertising material.

Other interesting departures inspected included a poster holder of a similar type to that for the new interchange scheme of advertising and display material which is receiving good support from many undertakings up and down the country. The holder is finished very smartly in chromium on ply. Downstairs, in the studio proper, the visitors saw a large variety of posters and displays. One of these, "Ice from Gas," called for favourable comment. The display was inspired by the fact that not a small body of the public still fail to appreciate that gas is capable of producing freezing conditions and it tells the story simply but convincingly. For displaying modern fires the Association have constructed surrounds that have the advantage of portability, being of light construction. Wood and paper have been used to such advantage that they look like the real thing and, of course, represent a considerable saving to the undertaking as well as overcoming the objection that is advanced in some quarters that the use of surrounds tie the showroom manager down to one particular pattern of fire owing to the high cost of making a change when they become out-of-date.

Naturally a great deal of work remains to be done on the premises, and considering that the display staff have been in their new quarters for only a fortnight, they have settled down remarkably well. The decorative scheme is in apple green and primrose. This combination which is proving increasingly popular in display work seems eminently suitable for this studio where so many excellent displays are being produced daily as well as being very restful to the eyes.



The Workshop.

A variety of material is being used in the studio and successful results have been achieved in the construction of display units with decorative metallic paper, mouldings, and photographic treatment. For the enlargement of positives in the latter process a room has been set apart for the installation of the necessary apparatus.

British Commercial Gas Association

Yorkshire District Conference at Bradford

The provisional programme for the Yorkshire District Conference of the B.C.G.A. to be held at Bradford on Thursday, Sept. 5, 1935, under the Presidency of Alderman F. J. Cowie, Chairman of the Bradford Gas Department, is as follows:

At 11 a.m. the delegates will be welcomed by the Lord Mayor of Bradford, Alderman Walter Hodgson, J.P. Then will follow two Addresses by Alderman Louis F. W. S. Smith, J.P., Chairman of the Health Committee, City of Bradford, and Sir Bruce Bruce-Porter, K.B.E., M.D., M.R.C.S.

Luncheon by kind invitation of the Bradford Gas Committee will be taken at the Midland Hotel, and will be followed by a visit to the works of Messrs. Jowett Cars, Ltd.

A "Women's Session" is to be held in the Midland Hotel at 3 p.m., and the chair will be taken by the Lady Mayoress, Miss E. Hodgson. Mrs. Eileen Murphy will give an Address on "Gas in the Home" which will be open to discussion.

A New House Organ

The *Cardiff Gas Review* Makes its Bow

Staff magazines are becoming the rule rather than the exception among the larger undertakings in the Industry; and many of the Co-Partnership Journals and magazines at present in existence reflect the greatest credit upon those concerned with their production. In addition to articles of general interest, these journals contain all the latest sales news, together with particulars of the athletic and social activities of the undertaking concerned. Indeed, many of them make fascinating reading to gas man and layman alike, and are, in fact, a sign of the times in an industry which stands for progress.

A newcomer to the ranks of gas undertaking house organs makes its bow this summer—the *Cardiff Gas Review*. This very bright and interesting little periodical has been launched with the object of keeping all the staff and workmen, and co-partners generally, fully informed of the activities of the Cardiff Gas Light and Coke Company. Those who spend their time on the works or away on the district will thus be able to keep in touch with the developments of gas policy and the activities of the sales staff and the showrooms.

Items of interest from each Section will be made available for the information of all departments—new gas appliances, and the general development of the Industry will be portrayed, so that all in the service of the Company may be in a position to make a united effort for the progress of the Industry.

At first sight, these worthy intentions may sound a tall order for one periodical; but a glance through the pages of the first number indicates at once that it can be done. Indeed, it would be hard to pack a more topical or valuable series of articles into the eight pages of the magazine. The latest gas appliances are described and illustrated, while useful notes, facts, and figures on a variety of gas subjects abound, and, together with a number of "domestic" items, constitute a remarkable publication.

We would congratulate the Cardiff Company upon the successful launching of this magazine and wish the *Cardiff Gas Review* all success in a future which should be deservedly bright.

Coke Oven Managers' Year Book

This book is printed for the Coke Oven Managers' Association for private circulation only by Benn Bros., Ltd., 154, Fleet Street, E.C. 4, and is now firmly established as a record of practical work and information, valuable to all who are in any way interested in coking practice. The editorial committee gratefully acknowledge the assistance of overseas members and others who have sent them information for the compilation of lists of coke oven plants abroad. The committee have successfully endeavoured to maintain the high standard of usefulness of the book and have included only such matter as is considered likely to be of service.

As in previous years the book includes information regarding the rules and members of the Association, as well as a complete list of coke oven plants in Great Britain and Overseas and those under construction abroad. The internal enthusiasm for the welfare of the Association which characterized the year's work is reflected in the excellent array of technical papers and discussions thereon which are reproduced in the work. Sixteen pages are devoted to technical data which include conversion tables; information regarding the properties of gases, liquids, and solids; stack losses on coke ovens; and benzole absorption. An index provides a handy means of reference to the work.

Gas Undertakings' Results

Colne.

The annual report on the Colne Gas Undertaking for the year ended March 31, 1935, states that there is a gross profit of £9,845 and a net profit of £652, which has been placed to revenue appropriation account. The Department has a debit balance on the revenue outlay account of £1,176, largely due to the fact that during the past year £3,555 was spent on converting Higgin House into a showroom. The coal carbonized during the year was 11,000 tons. The quantity of gas made per ton of coal carbonized was 20,958 cu.ft. compared with 20,675 cu.ft. during the year 1933-34. The total quantity of gas manufactured during the year was 230,559,000 cu.ft., a decrease of 4,134,000 cu.ft., or 1·7%. The average annual consumption per consumer with ordinary meter was 27,594 cu.ft., and per slot meter 18,849 cu.ft.

The number of consumers at the end of March, 1935, taken from the number of meters in use was 8,977, an increase of 122. There are 3,259 ordinary meters and 5,718 of the prepayment type. Last year 3,131 yds. of new gas mains were laid, bringing the total length in the area of supply to 58 miles. The number of public lamps in the Borough lighted by gas is 1,200, an increase of 20 during the 12 months. Actually the number of new lamps erected was 26, but 6 were dismantled in the Windy Bank area. The gas consumed by them was 23,954,000 cu.ft. and the total cost for gas, lighting, extinguishing, cleaning, repairing, as well as the erection of the 26 lamps referred to amounted to £5,105 8s. The new Showroom in Market Street was brought into use in the early days of September last. The sales outright for the year amounted to £4,383, being an increase of £1,285 compared with the previous year.

Kinross and Milnathort

The accounts of the Kinross and Milnathort Gas Company, Ltd., show a net profit for the year of £878. Depreciation of £519 was written off, leaving a disposable balance of £770, from which a dividend of 6%, tax free, has been declared. Gas sold last showed a decease of 500,000 cu.ft.

Lurgan.

The auditors' report of Lurgan Municipal Gas Undertaking's finances for the last year shows a total income of £19,768. Working profit amounted to £7,260, as against £5,124. Gas sales were up by £519 and residuals down £546. After charging £6,437 in respect of interest and loan redemption, a net profit of £823 resulted, as compared with a loss of £857 on the previous year's working. The cost of manufacture had decreased by 7d. per 1,000 cu.ft. to 4s. 2¼d. as compared with the previous year. During the year under review 82,466,700 cu.ft. of gas were consumed, an increase of 5,241,200 cu.ft.

Ossett.

The annual report upon the working of the Ossett Gas Department states that during the year 152,849,000 cu.ft. of gas were made and received, and 144,698,800 cu.ft. were sold. The make has increased by 685,000 cu.ft. and the sale has decreased by 1,672,700 cu.ft., the unaccounted-for gas being 5·3%. The gross profit for the year is £12,730. Interest, sinking fund, and income-tax amount to £11,600, leaving a profit on the year's working of £1,130. The reduction of £1,398 in the gross profit is chiefly accounted for by increased expenditure on repairs to works and plant, £300; more cookers and water heaters fixed, £500; general wages increased £600; rates and taxes increased £500; and gas income reduced by £400. It was a very mild winter, and this reduced the demand for gas for gas fires. Three or four large consumers for various reasons used together two million feet less gas; on the other hand, the extra number of cookers and water heaters fixed have increased the consumption for those purposes by just over two million feet. The Undertaking have repaired 362 meters at an average cost of £1 6s. 1d. per meter. This is a slight increase on last year's figure. Consumers by ordinary meter number 4,002, and by slot meter 5,340.

[*Further Undertakings' Results will be found on p.* 269.]

The Institution of Gas Engineers

RESULTS OF 1935 EXAMINATIONS

The undermentioned Candidates were successful in the 1935 Examinations in Gas Engineering and Gas Supply of The Institution of Gas Engineers, held under the Education Regulations of The Institution of Gas Engineers, as approved by the Government Education Departments of Great Britain and Ireland, and the City and Guilds of London Institute.

The Results do not include Candidates (*a*) who withdrew before the Examination, or (*b*) who, having Second Class Certificates, re-sat and failed to secure First Class Certificates, or (*c*) whose Examination has not been completed.

Appended is the Report of the Board of Examiners on the 1935 Examinations.

J. R. W. ALEXANDER,
Secretary.

28, *Grosvenor Gardens, London, S.W. 1.*
24th July, 1935.

Comparative Statistical Schedule of the 1934 and 1935 Examination Results.

Examinations.	1934.					1935.				
	First Class with Distinction.	First Class.	Second Class.	Failed.	Total Sat.	First Class with Distinction.	First Class.	Second Class.	Failed.	Total Sat.
External—										
Diploma in Gas Engineering (Manufacture)	..	3	4	2	9	..	2	4	3	9
H.G. Gas Engineering	1	8	12	8	29	..	3	12	7	22
O.G. Gas Engineering	1	10	17	20	48	..	3	20	13	36
O.G. Gas Engineering (single subject)	..	1	..	..	1	..	..	..	..	..
Diploma in Gas Engineering (Supply)	..	..	..	..	..	..	..	..	..	..
Diploma in Gas Supply	..	1	..	..	1	..	..	..	..	..
H.G. Gas Supply	..	3	4	8	15	..	3	6	7	16
O.G. Gas Supply	1	9	7	4	21	1	6	14	7	28
O.G. Gas Supply (single subject)	..	4	4	..	8	1	6	2	..	9
Internal—										
H.G. Gas Engineering	1	29	38	15	83	..	10	21	23	54
O.G. Gas Engineering	5	9	22	10	46	1	12	22	17	52
O.G. Gas Engineering (single subject)	1	2	2	..	5	..	3	..	..	3
H. G. Gas Supply	2	11	25	11	49	3	18	32	13	66
O.G. Gas Supply	8	24	54	19	105	13	30	55	19	117
O.G. Gas Supply (single subject)	4	10	10	1	25	1	22	3	..	26
Total	24	124	199	98	445	20	118	191	109	438

EXTERNAL CANDIDATES (81).

Diploma in Gas Engineering (Manufacture) (6).

Class.	Name.	Town.	Subject of Thesis.
First	Haffner, A. E.	Ewell	"The Gasification of Breeze-Coke Mixtures in Step-Grate Producers."
,,	Ross, L. A.	Portsmouth	"The Theory and Practice of Benzole Recovery on an 8,000,000 Therms per Annum Works; Its Relation to Manufacturing Economies."
Second	Bell, F.	Liverpool	"A Method for Increasing the Ignitability of Coke."
,,	Harrison, A.	Great Harwood	"Inspection and Maintenance of Water Sealed Gasholders."
,,	Shelley, W. J.	Hinckley	"Mixing of Coking and Non-Coking Coals in Relation to Vertical Retorts."
,,	Turner, C. R. E.	Birmingham	"Improvements in Carburetted Water Gas Plants and their Auxiliary Equipment."

Higher Grade Certificate in Gas Engineering (15).

Class.	Name.	Town.
First	Copp, A. D. L.	Exeter
,,	Smith, J.	Workington
,,	Speers, J. A.	Morecambe
Second	Banner, G. E.	Margate
,,	Brake, N. T.	Southampton
,,	Burkhill, G. E.	Crewe
,,	Clapham, T. W.	Bristol
,,	Fitton, G.	Stroud
,,	Gamper, A. J. L.	Purley
,,	Gaskarth, J.	Maryport
Second	Harrison, H. C.	Belfast
,,	Hartley, A. G.	Blackpool
,,	Martindale, J. R.	Bristol
,,	Shilson, A. C.	Weston-super-Mare
,,	Wilson, J. L.	Kendal

Ordinary Grade Certificate in Gas Engineering (23).

Class.	Name.	Town.
First	Findon, W. H. C.	Sandown
,,	Henry, J. A.	Doncaster
,,	Monkton, H. N.	Brierley Hill
Second	Barnetson, G. R.	Winchester
,,	Bennett, L.	Blackpool
,,	Bromhead, J.	Macclesfield
,,	Crofts, J. F.	Stoke-on-Trent
,,	Davis, J. W.	Dublin
,,	Derbyshire, K.	Malvern Link
,,	Foston, R. H.	Torquay
,,	Hammerton, W.	Manchester
,,	Hornby, N.	Hessle
,,	Huxham, S. C.	Ilfracombe
,,	Ivens, R.	Weston-super-Mare
,,	Jones, K. E.	Stoke-on-Trent
,,	Laird, N.	London
,,	Milthorp, F. R.	Grimsby
,,	Orchard, J.	Shanklin
,,	Osmotherley, R.	Holyhead
,,	Petch, G. H.	Southampton
,,	Smith, L. W.	Bridlington
,,	Taylor, J. B.	Manchester
,,	Wright, S. E.	Norton-on-Tees

Higher Grade Certificate in Gas Supply (9)

Class.	Name.	Town.
First	Copp, A. D. L.	Exeter
,,	Rea, A. C.	Edinburgh
,,	Ross, L. A.	Portsmouth
Second	Cooper, F. T.	Workington
,,	Fox-Andrews, J. S.	Bristol
,,	Hemingway, C. W.	Featherstone
,,	Offen, W. J.	Ramsgate
,,	Patching, H. J.	Deal
,,	Winter, A. J.	Nottingham

Ordinary Grade Certificate in Gas Supply (21).

Class.	Name.	Town.
First	Barclay, W. W.	London
,,	*Foster, D. A.	Manchester
,,	Hartley, A. G.	Blackpool
,,	Jones, S. T.	Colwyn Bay
,,	Kelly, J. H.	Kendal
,,	Masters, J.	Shrewsbury
,,	Reynolds, B.	Exeter
Second	Barralet, C. E.	Petts Wood
,,	Colpus, R. H.	Margate
,,	Craven, F.	Halifax
,,	Crosby, G. H.	Bristol
,,	Davis, K.	Stoke-on-Trent
,,	Dennis, G.	Plymouth
,,	Foulds, R. W.	Southport
,,	Freeman, R. E.	Stoke-on-Trent
,,	Griffiths, H. W. G.	Portsmouth
,,	Higgs, A.	Stoke-on-Trent
,,	Leonard, A. W.	Tunbridge Wells
,,	Offen, W. J.	Ramsgate
,,	Richardson, J.	Sheffield
,,	Tomlinson, W.	Macclesfield

* With Distinction.

Ordinary Grade (Single Subject) Examination in Gas Supply to qualify to sit for the Diploma Examination in Gas Engineering (Manufacture) (7).

Class.	Name.	Town.
First	Facer, A.	Bristol
,,	Fitton, G.	Stroud
,,	Hutchinson, R.	Worksop
,,	Longhurst, R. S.	Rochdale
,,	*Murray, G. F. J.	Plymouth
,,	Pennington, C. W.	Newbury
,,	Vince, D. A.	Swindon

* With Distinction.

INTERNAL CANDIDATES (243).

Higher Grade Certificate in Gas Engineering (31).

Class.	Name.	Centre.
First	Calvert, N.	Sir John Cass
,,	Dawson, F.	Regent Street
,,	Facer, A.	Manchester
,,	Fielder, H. L.	Birmingham
,,	Fulton, J. H.	Glasgow
,,	Hawes, J. M.	Regent Street
,,	Marriage, E. B.	,,
,,	Tate, W. K.	,,
,,	Tomes, J. A.	Birmingham
,,	Webber, J. M. E. W.	Regent Street
Second	Bairstowe, R.	Wrexham
,,	Balsom, S. E.	,,
,,	Bates, E.	Manchester
,,	Brown, H. H.	Edinburgh
,,	Caton, W. F.	Derby
,,	Chambers, K. E.	Birmingham
,,	Chorley, A. E.	Regent Street
,,	Denoon, J. R.	Edinburgh
,,	Dougherty, C. J.	Leeds
,,	Gibbins, E. A.	Leicester
,,	Grant, A. F.	Regent Street
,,	Gunn, A. D. C.	Cardiff
,,	Hart, R. V.	Manchester
,,	Law, R. K.	,,
,,	Millington, H.	Wrexham
,,	Richmond, E. H.	Sir John Cass
,,	Rickard, C. H.	Leeds
,,	Roberts, T. W.	Birmingham
,,	Spalding, T. G.	Regent Street
,,	Stafford, J. H.	Birmingham
,,	Weatherley, W. E.	Newcastle-upon-Tyne

Ordinary Grade Certificate in Gas Engineering (35).

Class.	Name.	Centre.
First	Bain, L.	Kirkcaldy
,,	Christie, J.	,,
,,	Clark, J. R.	Newcastle-upon-Tyne
,,	Fyfe, D. L.	Kirkcaldy
,,	Gale, W. A.	Birmingham
,,	Genge, K. D.	Westminster
,,	Hepworth, J.	Huddersfield
,,	Howarth, R.	,,
,,	Renshaw, A. K.	Manchester
,,	Robinson, C. F.	Regent Street
,,	Ross, T.	Kirkcaldy
,,	Sloman, K. F.	Plymouth
,,	*Spry, J. G. T.	,,
Second	Anderson, J. A.	Edinburgh
,,	Benyon, F. E.	Burnley
,,	Brookes, J. E.	Blackpool
,,	Dick, A.	Dundee
,,	Geddes, W. R.	Manchester
,,	George, L. A.	Regent Street
,,	Gorman, E. F.	Westminster
,,	Greenway, N. H.	Cardiff
,,	Hogg, J. C.	Manchester
,,	Iles, J. F.	Cardiff
,,	Jones, R.	Wrexham
,,	Kay, G. W.	Leeds
,,	McLeish, J. M.	Dundee
,,	Mear, N.	Huddersfield
,,	Nicol, L. A.	Glasgow
,,	Northen, B.	Westminster
,,	Pitcairn, J.	Kirkcaldy
,,	Richardson, P. G.	Plymouth
,,	Robinson, R. F.	Regent Street
,,	Shipley, T. W. E.	Derby
,,	Wilkinson, J.	Leeds
,,	Young, J. M.	,,

* With Distinction.

Ordinary Grade (Single Subject) Examination in Gas Engineering qualify to sit for the Diploma Examination in Gas Engineering (Supply) (3).

Class.	Name.	Centre.
First	Eames, F. S.	Westminster
,,	Munns, R. M.	,,
,,	Reid, A. C.	Leeds

Higher Grade Certificate in Gas Supply (53).

Class.	Name.	Centre.
First	Allsop, S. F.	Birmingham
,,	Atlee, C. H.	Westminster
,,	Blackwell, G. A.	Birmingham
,,	*Clarke, H. G.	Westminster
,,	*Coltman, R. F.	,,
,,	Cooper, F. G.	,,
,,	Critchley, G. N.	,,
,,	Crump, R. R.	Birmingham
,,	Dickson, D. L.	Edinburgh
,,	Fry, L. G.	Westminster
,,	Holwell, C. C.	,,
,,	Huskisson, J.	,,
,,	Milne, H. S.	Glasgow
,,	*Muggleton, H. H.	Westminster
,,	Parker, G. W. A.	,,
,,	Priday, C. O. M.	,,
,,	Roberts, F.	Bradford
,,	Smith, E. G.	Glasgow
,,	Spurrier, E. J.	Westminster
,,	Tennyson D'Eyncourt, R. E. L.	,,
,,	Woolidge, R. A.	,,
Second	Bedford, G. F.	,,
,,	Birch, A. R.	,,
,,	Brooks, W.	Newcastle-upon-Tyne
,,	Coulden, G. H. R.	Westminster
,,	Cusins, G. R. S.	,,
,,	Edwards, T. F.	Cardiff
,,	Fishlock, C.	Westminster
,,	Fulton, J. H.	Glasgow
,,	Gibbons, S. J.	Westminster
,,	Gilchrist, W.	Glasgow
,,	Gilden, G.	Manchester
,,	Harding, S. C.	Westminster
,,	Henson, N. L.	,,
,,	Hulbert, J. W.	East Ham
,,	Jukes, J. E.	Birmingham
,,	Keillor, H. G.	Glasgow
,,	Kohlbeck, W. H.	Westminster
,,	Lewis, W. F. W.	,,
,,	Mead, D. G.	,,
,,	Norton, G.	Newcastle-upon-Tyne
,,	Palmer, R. G.	East Ham
,,	Pickering, E. W.	Leicester
,,	Proud, E.	Newcastle-upon-Tyne
,,	Reilly, N. R.	Birmingham
,,	Robinson, R. L. L.	,,
,,	Sawers, T. R.	Glasgow
,,	Stokes, S. H.	Huddersfield
,,	Unite, S. G.	Westminster
,,	Vinten, J. C.	,,
,,	Walsh, J. B.	Manchester
,,	Waterman, F. A.	Westminster
,,	Westwood, R. A.	Birmingham

* With Distinction.

Ordinary Grade Certificate in Gas Supply (98).

Class.	Name.	Centre.
First	Arnold, C. P.	Westminster
,,	*Bain, L.	Kirkcaldy
,,	*Bak, K. A.	Leicester
,,	Bath, D. J. O.	Westminster
,,	Bennett, L.	,,
,,	Bish, H. G.	,,
,,	*Bradfield, R. A.	,,
,,	*Bremner, H. J.	,,
,,	*Brookhouse, R. N.	Leicester
,,	Cole, G. F.	Westminster
,,	Collis, E. G.	,,
,,	Curle, H.	Newcastle-upon-Tyne
,,	*Denham, J.	Huddersfield
,,	Farrow, H. G. H.	Westminster
,,	Fyfe, D. L.	Kirkcaldy
,,	Galley, D. H.	Westminster
,,	Goodman, J. E.	East Ham
,,	Gosling, R. G.	Westminster
,,	Greene, E.	Hull
,,	Haddacks, N. A. C.	,,
,,	How, C. A.	,,
,,	Hunter, P. D. V.	,,
,,	Jennings, A. C.	,,
,,	Jewers, V. C. P.	,,
,,	Laing, D.	Kirkcaldy
,,	Langford, R. G.	Westminster
,,	Lock, H. W.	,,
,,	Mays, P. H.	,,
,,	*Newman, H. C.	,,
,,	*Old, A. A.	,,
,,	Page, L. P.	,,
,,	Pendegrass, C.	East Ham
,,	*Peters, K. G.	Westminster
,,	*Prestage, C. H.	,,
,,	Ramsey, C. M.	,,
,,	Roberts, L. G.	Birmingham
,,	Rolls, C. G. S.	Westminster
,,	*Rowe, N.	Tunstall, Stoke-on-Trent
,,	*Salusbury, R. C. W. T.	Westminster
,,	Smith, J.	,,
,,	*Thoms, R. C.	East Ham
,,	Treagus, G. A.	Westminster
,,	Witt, A. L.	,,

Class.	Name.	Centre.
Second	Anderson, J. A.	Edinburgh
,,	Arnott, P.	Westminster
,,	Asquith, J. J.	Cardiff
,,	Barr, R. B.	Westminster
,,	Basford, T. J.	,,
,,	Brown, N. L.	,,
,,	Calvert, K. E.	East Ham
,,	Carless, I. F.	Cardiff
,,	Catley, G.	Huddersfield
,,	Christie, J.	Kirkcaldy
,,	Cooney, K.	South East London
,,	Cooper, A. L. C.	Westminster
,,	Cotton, G. E.	Leicester
,,	Drower, R. V. P.	Southend-on-Sea
,,	Edkins, H. A.	Birmingham
,,	Ellis, J.	,,
,,	Ellis, R. P.	,,
,,	Ennals, A. J.	East Ham
,,	Fisher, F. S.	Huddersfield
,,	Foskett, H. D.	Westminster
,,	Gower, R. A.	,,
,,	Graham, T. S.	Kirkcaldy
,,	Healy, H. B.	Westminster
,,	Hodgkinson, P. B.	Birmingham
,,	Holdaway, J. W.	Westminster
,,	Hulme, S.	Tunstall, Stoke-on-Trent
,,	Jenns, J. C.	Westminster
,,	Kimber, M. S.	,,
,,	Layton, W. H.	,,
,,	Lock, R. W.	East Ham
,,	Martin, L. G.	Westminster
,,	Mathieson, H.	,,
,,	Metzner, R. V.	,,
,,	Miller, A. L.	Leicester
,,	Nicol, L. A.	Glasgow
,,	North, S. F.	Westminster
,,	Pears, G. E.	,,
,,	Poole, F. A.	Newcastle-upon-Tyne
,,	Porcher, A. F. R.	Westminster
,,	Quickenden, J. W.	,,
,,	Randall, E. C.	,,
,,	Riddle, J. L.	,,
,,	Ross, T.	Kirkcaldy
Second	Roundell, M. H. R.	Westminster
,,	Shergold, A. J.	,,
,,	Smith, T. R.	,,
,,	Stone, H.	,,
,,	Taylor, T. H.	,,
,,	Thornton, A. T.	,,
,,	Thurley, R.	,,
,,	Watkin, E.	,,
,,	Watson, H. W.	Newcastle-upon-Tyne
,,	Watson, S. A.	,, ,,
,,	Welch, C. F.	Westminster
,,	Witt, W. S.	,,

* With Distinction.

Ordinary Grade (Single Subject) Examination in Gas Supply to qualify to sit for the Diploma Examination in Gas Engineering (Manufacture) (23).

Class.	Name.	Centre.
First	Brookes, J. E.	Blackpool
,,	Casseldine, G. E.	Westminster
,,	Cranmer, A. G.	Birmingham
,,	Curry, H.	Blackpool
,,	Gould, A. K.	Huddersfield
,,	Graham, J. C.	Newcastle-upon-Tyne
,,	Haslock, R. C.	Bradford
,,	Jennings, A. P.	Leeds
,,	Kay, G. W.	,,
,,	King, F. H.	Manchester
,,	McManus, J. E.	Newcastle-upon-Tyne
,,	Norton, R. L.	Westminster
,,	Pleadon, R. F.	Birmingham
,,	Sidaway, F. W.	,,
,,	Smith, W. J.	,,
,,	Stafford, J. H.	,,
,,	Stevenson, E. W.	Leicester
,,	Sumner, P.	Manchester
,,	Taylor, N. R.	Birmingham
,,	Tomes, J. A.	,,
,,	*Wall, C. D.	East Ham
,,	Ward, H. A.	Birmingham
,,	West, A. E.	,,

* With Distinction.

1935 REPORT OF THE BOARD OF EXAMINERS

The Board of Examiners has pleasure in submitting to the Gas Education Committee, for presentation to the Council of The Institution of Gas Engineers, its Report on the 1935 Examinations held under the Education Regulations of the Institution, as approved by the Government Education Departments of Great Britain and Ireland and the City and Guilds of London Institute.

During the year 1934-35, the members of the Board of Examiners and the Assessors appointed by the Council were:—

Major Courses.

Examiners: Harold C. Smith, M.Inst.C.E. (London)—Chairman; J. M. Campbell, J.P. (Margate), J. H. Canning, O.B.E., J.P., F.C.S. (Newport, Mon.), T. Carmichael, M.Inst.C.E., M.I.Mech.E. (Portsmouth). R. Robertson. M.Inst.C.E. (Bristol), and Dr. E. W. Smith, C.B.E. (London)—Gas Engineering. W. A. Bishop (Croydon), S. B. Chandler, A.M.I.Mech.E. (London), J. G. Clark (London), W. Dieterichs (London), H. R. Hems (Birmingham), and E. F. Keable (Great Yarmouth)—Gas Supply.

Assessors: England and Wales: R. Robertson M.Inst.C.E. (Bristol)—Gas Engineering; S. B. Chandler, A.M.I.Mech.E. (London)—Gas Supply. West of Scotland: David Fulton (Helensburgh) and John W. McLusky, M.I.Mech.E. (Glasgow)—Gas Engineering and Gas Supply. East of Scotland: J. Jamieson (Edinburgh) and J. W. Napier (Alloa)—Gas Engineering and Gas Supply.

Minor Courses and Gas Fitting Courses.

Examiners: E. Crowther, M.Eng., A.M.Inst.C.E. (Salford)—Gas Works Practice; E. F. Keable (Great Yarmouth)—Gas Supply Practice; W. Dieterichs (London) and T. V. Garrud (London)—Gas Fitting; W. E. Harrison (Birmingham)—Elementary Science.

HAROLD C. SMITH,
Chairman,
Board of Examiners.

J. R. W. ALEXANDER,
Secretary,
The Institution of Gas Engineers.

28, Grosvenor Gardens,
London, S.W. 1.
26th June, 1935.

The work submitted for the 1935 Examinations in Gas Engineering and Gas Supply was on the whole good, although in some Grades the average standard was lower than in 1934. An improvement was noticeable in the sketches submitted by the Internal Candidates in Ordinary Grade Gas Engineering and by the Internal and External Candidates in Higher Grade Gas Supply. In the other Examinations, however, the sketching showed no improvement and was mainly poor. Greater use of the squared paper provided in the Answer Books would simplify sketching and assist towards attaining neatness and speed.

Candidates in all Grades experienced difficulty in communicating their knowledge; they should be trained to answer the Questions in a concise manner under headings, rather than by means of long and involved statements. Time would thus be saved and loss of marks through being unable to answer the requisite number of Questions would be minimized.

Gas Engineering—Ordinary Grade.

In the Examination for the Ordinary Grade Certificate in Gas Engineering, the work of the Internal Candidates was of a fairly high standard. The Questions appeared to have been more carefully studied than usual and this was reflected in the Answers which, generally, covered all the essential points involved.

Although the knowledge shown by the External candidates in their Answers and the method of presentation were of a good standard, the Results were not as good as in the previous year. Many Answers indicated that the Questions had not been carefully read before being attempted. The Question on the Safety Governor was not answered by the majority of candidates, which would indicate that the need for this appliance had not been explained.

Gas Engineering—Higher Grade.

The work submitted by the Internal and External Candidates for the Higher Grade Certificate in Gas Engineering was of a lower standard than in 1934. Many candidates wasted time by transcribing the Question before commencing the Answer, many omitted to give the number of the Question answered, and others did not properly apportion the time for each Question. Students without Drawing Office experience should be encouraged to practice drawing more frequently.

Gas Engineering (Manufacture)—Diploma Grade.

In the Examination for the Diploma in Gas Engineering (Manufacture) the work submitted in Part I did not reach the standard desired, which was frequently due to the

answering of Questions by long rambling statements instead of by concise paragraphs under appropriate headings, thus leaving insufficient time for the remaining Questions. In Part II the work was of a higher standard. The Question on the Gas Engine, which should appeal to Gas Engineering Students, was avoided by most candidates and was not well answered by the few who attempted it. This subject requires attention.

Gas Supply—Ordinary Grade.

The work submitted by the Internal Candidates for the Ordinary Grade Certificate in Gas Supply was, generally, of a high standard and indicated that the subjects were understood.

The standard of knowledge shown by External Candidates on the general Questions was good, but the Question dealing with gas for industrial purposes was avoided. Many candidates appeared to have difficulty in answering the Questions in the time allowed.

Gas Supply—Higher Grade.

The work of the Internal and External Candidates in Part I of the Examination for the Higher Grade Certificate in Gas Supply showed a good knowledge of the subjects dealt with. In Part II the standard of work submitted was lower than that submitted in Part I, probably due to the last two Questions being badly answered. In the first of these two Questions some candidates confused the two terms "reflector" and "refractor," whilst others were obviously not familiar with the principle of "refraction."

Gas Engineering (Supply)—Diploma Grade.

There were no candidates for the Diploma in Gas Engineering (Supply) or for the Diploma in Gas Supply.

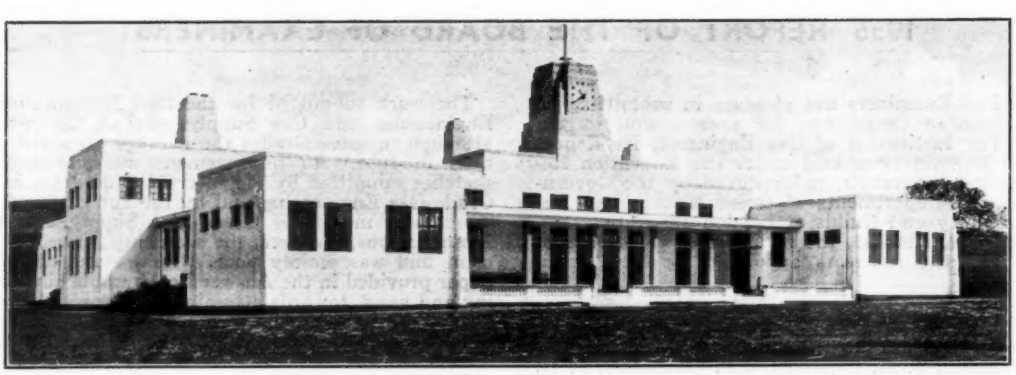
Minor Course Certificates in Gas Works Practice and Gas Supply Practice.

The Report of the Examiners of the City and Guilds of London Institute on the Examinations for Minor Course Certificates in Gas Works Practice and Gas Supply Practice indicates that the instruction given to Students in Gas Works Practice appears adequately to have covered the Syllabus. If candidates supplemented this instruction with their own observation and reasoning, the standard would be very satisfactory. In Gas Supply Practice the Questions appear to have been clearly understood. The Answers submitted were of average standard. The sketching has improved and in some cases was very good. A limited understanding of the subject of Steel Mains was shown. Attention is again drawn to the lack of knowledge of the Gas Engine.

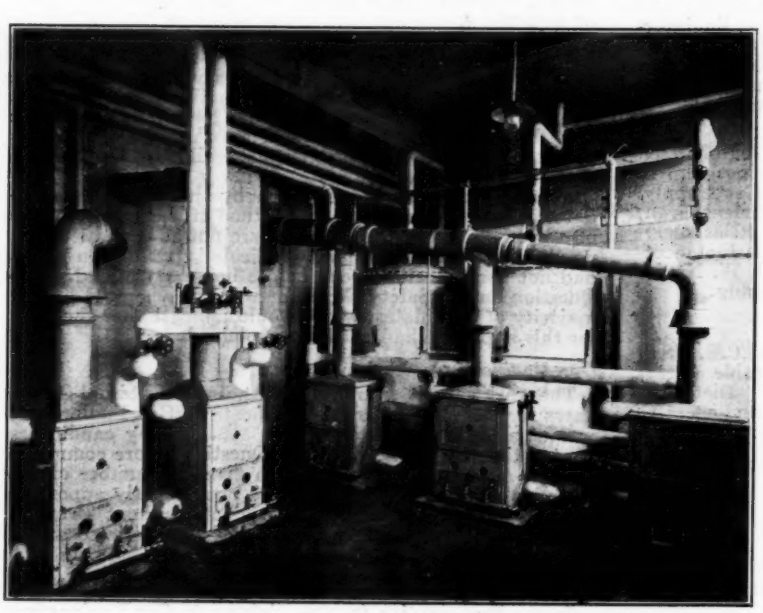
Gas Fitting Certificates.

The Report of the Examiners of the City and Guilds of London Institute on the 1935 Examinations in Gas Fitting states that the ability of candidates to express themselves showed improvement. They appeared to have benefited by following the advice, so often given, to read carefully the Questions before attempting the Answers. Sketches showed marked improvement and more candidates wisely used these to illustrate their Answers.

A Fine Gas Heating Installation



The Sports Pavilion at Pitreavie Playing Fields, Dunfermline.



Gas Installation in the Pavilion for Central Heating and Hot Water Supply for Basins and Baths.

The Pitreavie Playing Fields have been provided by the Carnegie Dunfermline Trust for the use of local sports clubs, who may have the use of a playing pitch together with the pavilion and including washing and bathing facilities, dressing rooms, and lounge and tea rooms, for the very small charge of 2s. 6d. per match, covering both teams. There are eight pitches available in the fields for cricket, football, and hockey. The heating installation—for the particulars of which we are indebted to Mr. James Campbell, Engineer and Manager to the Dunfermline Gas Department—consists of "Ideal" gas boilers, the two on the left of the photograph providing the central heating of the pavilion, and the three on the right are connected to three hot water storage tanks, each of 500 gallons capacity, supplying 15 hand basins, 15 foot baths, and 15 spray baths. In addition, gas is used exclusively in the kitchen attached to the tea rooms. These Playing Fields are, as can be imagined, very extensively used, and gas has proved of the greatest service in meeting the large and often sudden demand for hot water.

Coke for Domestic Heating

In which Mr. J. E. MACONACHIE (Gas Research Fellow) and Mr. C. TASKER (Research Fellow in Fuels), of the Ontario Research Foundation, Toronto, discuss the relations between the physical and chemical properties of coke and its firing characteristics in domestic furnaces.

I.—Introduction.

Domestic heating in the larger towns in Canada is mainly effected by hot air or hot water furnaces of the type shown in fig. 1, reproduced by courtesy of the Dominion Department of Mines. The fire pots of hot water furnaces have volumes of $3\frac{3}{4}$ to $10\frac{1}{2}$ cu.ft.; those of hot air furnaces have from $1\frac{1}{2}$ to 4 cu.ft. in volume. It will be seen from fig. 1

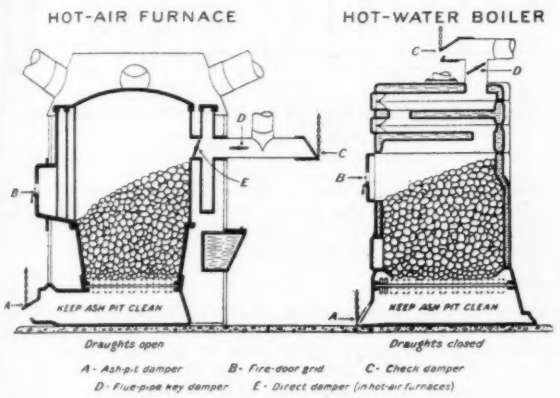


Fig. 1.—Typical Central Heating Furnaces.

that in the hot water furnaces heat is transferred by radiation from an incandescent fuel bed to the water jacket and lower section, the upper sections being heated mostly by conduction from the hot flue gases.

Fuels Used.

Though a rather wide variety of fuels is used in domestic heating furnaces, the use of coke in place of anthracite is gradually increasing, as is shown by Table 1.

TABLE 1.—*Use of Coke as Domestic Fuel in Ontario and Quebec*

Year.	Quantity in Thousands of (Short) Tons. By-Product and Gas Coke.		Percentage of Total Tonnage of Solid Fuels Distributed for Domestic Use.	
	Ontario.	Quebec.	Ontario.	Quebec.
1926	699·2	112·8	18·8	7·1
1928	925·1	162·2	21·2	8·2
1930	1,070·5	170·3	23·9	7·8
1932	1,131·0	181·9	29·5	9·4

This increase has taken place in spite of the difficulty that has been experienced in persuading the average householder to change his firing methods when burning coke. The volume relation between coke and anthracite has been a great obstacle in the introduction of coke.

II.—Experimental Work.

During the winter of 1931-32, samples of eight cokes, chosen as representative of the central Canada supply, were bought on the Toronto market at regular monthly intervals. They consisted of two by-product oven cokes, two metallurgical cokes, two gas retort cokes, all graded between 1 in. and $2\frac{1}{2}$ in., and the same two gas retort cokes graded between $\frac{1}{2}$ in. and 1 in. Their physical and chemical properties were determined in the laboratory by standard methods, and their firing characteristics investigated quantitatively by two series of burning tests. In the first series a weighed quantity of coke was ignited and allowed to burn out under constant draught conditions. In the second a fire was maintained under standardized conditions of heat output for five days, a sample of refuse to approximate that which would result from normal long-time operation being taken on the third day.

As this work was carried out in house heating appliances of the type and size common in Canadian practice, many of the conclusions and observations made do not apply to coke burning appliances in England. It is the purpose of this Paper, however, to discuss those relationships between the physical and chemical properties of coke and its firing characteristics that are considered to be of general applicability.

III.—Chemical Properties.

Moisture.

The rôle of moisture in coke has been the subject of a number of conflicting statements few of which have been substantiated by experimental data. Some reasons advanced for better burning characteristics of wet coke are:

(1) *Formation of Water Gas.*—It is, or was, the opinion of many combustion engineers that during the burning of wet coke water gas was formed which could subsequently be burned with secondary air among the tubes of a boiler or the sections of a hot water heater, and thus improve the efficiency of the furnace. With underfeed stokers, where the gases driven off from fresh fuel pass up through the combustion zone, water gas may be formed, but in hand-fired furnaces the water must all be driven off long before the fresh coke reaches a sufficiently high temperature for the water gas reaction to take place.

(2) *Control of Combustion.*—The claim has been made that the moisture in coke tends to retard its combustion and helps to prevent a fire becoming too hot. To evaporate moisture heat has to be drawn from the fuel bed. This occurs just after a fresh charge of fuel is fired, and the retarding influence is brought to bear on the fire during the kindling of this charge when there is no need for it, and its effect has been dissipated before combustion attains an undesirably high rate.

(3) *Density of Fuel Bed.*—It has been claimed that wetting coke results in better packing and hence higher bulk density. Our measurements of bulk density showed no such effect on the dry basis, although, of course, a cubic foot of wet coke weighs more than one of dry coke by the amount of water it contains.

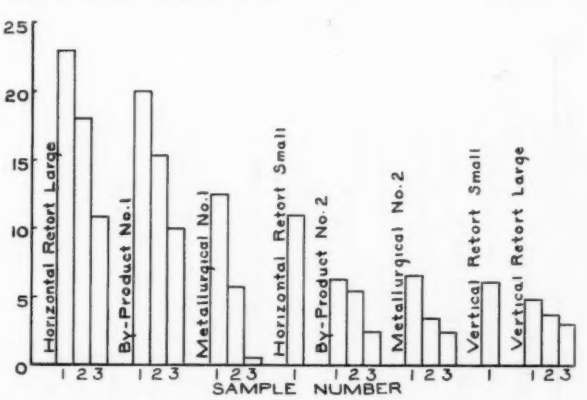


Fig. 2.—"As Received" Moisture Contents of Monthly Coke Samples.

On the other hand, moisture is a straight adulterant when coke is sold on a weight basis, or in other words it lowers the calorific value of the fuel as fired by an amount directly proportional to the moisture content *plus* a small amount of heat required to evaporate the water. When coke is sold on a volume basis, only the latter factor affects the calorific value per unit volume. It would appear that the correct amount of moisture is just that amount which is necessary to keep the coke from being excessively dusty.

The specifications of the American Society for Testing Materials allow 3% moisture for foundry coke in contrast to moisture contents up to 20% observed in domestic coke.

Fig. 2 shows a comparison of the eight cokes tested in regard to their moisture contents, and gives also the variation from month to month in six of them. There is evidently little control of the moisture content exercised and a wide difference in policy in the amount allowed.

Volatile Matter.

To date no significant tonnage of low-temperature coke has been marketed in Canada. The high-temperature cokes sold contain from 1 to 3% of volatile matter and variations are small. It is undoubtedly true that if more volatile matter were left in the coke it would ignite more easily, and while this might improve some of the less reactive cokes, any variation possible within the limits of high-temperature carbonization is overshadowed by other factors which will be discussed later. The principal reason for opposing an increase in volatile matter is that it represents a potential wastage of heat units and hence could only be effected at the expense of thermal efficiency.

Ash Content.

The cokes tested contained between 8 and 10% ash reckoned on the dry basis. While these cokes were in competition with American anthracite only, this amount was not considered high, but it became so when compared with British anthracite. The coke producer can keep the ash content of his product as low as possible by the elimination of breeze and the carbonization of selected coals, but beyond this there is little he can do. Mineral matter provides no heat, and any amount in excess of a small percentage which can be said to be useful for supporting the fuel on the grates, protecting the grates, and helping to regulate draughts, increases the time, labour, and dirtiness of furnace operation. It has, moreover, a definite effect on the manner in which the coke burns. In tests made by the Fuel Research Board[1] it was shown that in open fires the maximum rate of radiation obtained decreased in proportion to the ash content, and the subsequent diminution of radiation was also more rapid for the cokes with the higher ash contents. Both these effects were noted to a degree that could not be accounted for arithmetically by the decrease in fixed carbon contents. In furnaces depending mainly on radiation for the transfer of heat to the water or surroundings this factor will definitely influence their efficiency, but in furnaces which provide for the extraction of heat from the flue gases by a number of sections (see fig. 1) it will not be so important.

The refuse taken from a fire always contains some combustible matter, a factor which exerts a large effect on the thermal efficiency of the fuel and has not been given the attention it merits due to its difficulty of determination and variability under different sets of circumstances. A choice between two fuels is often made on the basis of a difference of 100 B.Th.U. per pound, when the difference between the number of thermal units lost due to unburnt material in the refuse may amount to 500 or more. Fig. 3

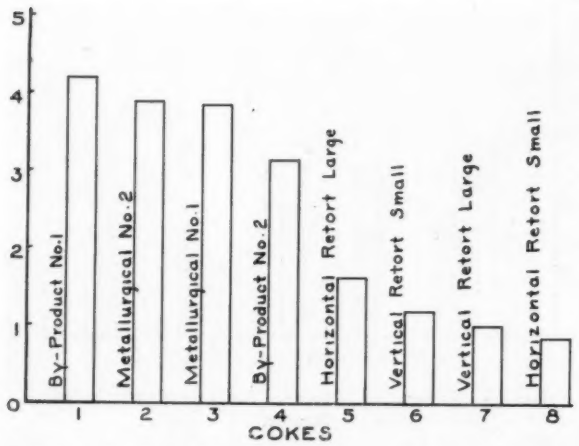


Fig. 3.—Per Cent. of the "As Received" Calorific Value lost to Refuse in long Firing Tests.

shows the percentage of the "as received" calorific value of the coke found in the refuse removed after three days of the long firing tests, which figure approximates that obtainable under normal operation. Fig. 4 shows the same factor based on the refuse left from the short tests, and consequently the percentages shown may be considered as the maximum obtained when operating conditions are abnormal. From these charts it will be seen that the maximum difference among the eight cokes is at least 350 B.Th.U. per pound under the most favourable conditions, and may amount to over 1,000 B.Th.U. per pound. A

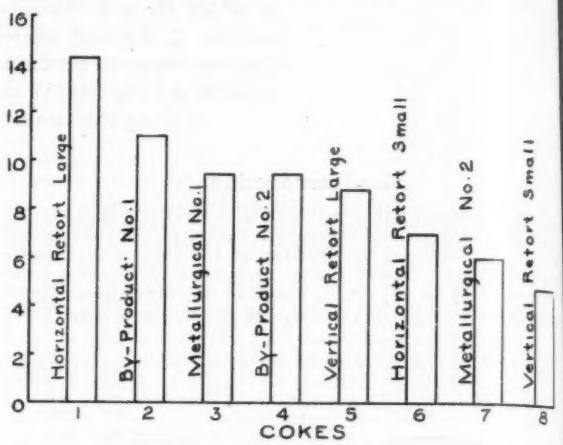


Fig. 4.—Per Cent. of the "As Received" Calorific Value lost to Refuse in short Firing Tests.

comparison of figs. 3 and 4 shows how greatly the combustible content of the refuse may vary with the firing conditions, particularly in the cases of horizontal retort coke and metallurgical coke No. 2.

Fusibility of Ash.

The softening temperature of the ash as determined by the standard methods is only a general or comparative guide to the tendency of a coke to produce clinker. A number of variables enter into the question, such as the distribution of ash in the fuel, distribution of fluxing constituents of the ash, the conditions of firing, and related circumstances difficult to define. Furthermore there is no absolute standard by which clinkering difficulties may be measured. Various empirical gradings have been devised, but they are of limited applicability due not only to the wide variety of equipment in which fuel is burned, but also because operators have different ideas as to what constitutes trouble. In the case of the cokes tested the ash fusion temperatures varied from 2,400° to 2,700° F., determined under mildly oxidizing conditions. Undue clinkering with these fuels is generally caused by abnormal firing conditions and can easily be avoided. It is usually brought about by cutting off the cooling primary air from a hot fire either by operation of draught controls or by firing a thick bed of fresh fuel.

Ignitability.

There are a number of factors which have a considerable effect on the ignitability of a coke, so that the ignition temperature alone cannot be taken as a good index of the amount of kindling necessary to start a fire. Determinations of ignitability involve tedious trial and error methods and are not often made. The data that have been obtained have established no direct relationship between ease of ignition and any other property or combination of properties of coke. In the present investigation the amount of gas required to ignite a 25-lb. charge of raw fuel on bare grates was determined and recorded as the ignitability. The property having the greatest effect was the density. The more porous cokes, due perhaps to better insulation, were brought up to the ignition temperature with less heat than the denser ones and the fire spread through them more rapidly. There remained, however, large differences between cokes of nearly the same density that could not be accounted for. The large variation between the cokes tested is shown in fig. 5.

Calorific Value and Sulphur.

The cokes tested showed little difference in calorific value measured on the dry basis. The "as received" values were, of course, affected by high moisture contents. All the cokes contained less than 1% of sulphur.

There appears to be a lack of agreement among producers as to what is meant by calorific value, and a need for a standard definition for commercial use. There are six different values which may be assigned to any one fuel and the one which should be quoted is that which refers to the fuel in the condition in which it is to be used. The six

are the gross and net values on the " as received," " dry," and " dry ash-free " bases. The gross calorific value is the heat evolved when combustion constitutes a reaction in the thermo-dynamic sense—that is, when the products are brought to the same conditions of temperature and volume as were the original reagents. It thus includes the

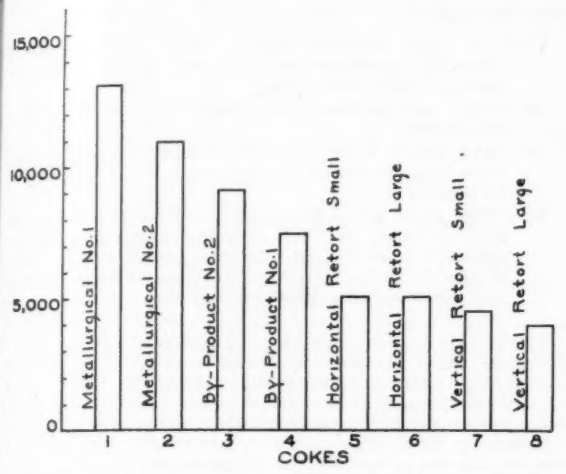


Fig. 5.—Ignitability. B.Th.U. necessary for Ignition of 25 lb. Coke on bare Grates.

sensible heat in the products of combustion together with the latent heat of condensation of the water contained therein. This is the value obtained from calorimetric determinations in the laboratory and the one almost universally used in conjunction with gross efficiencies. The net calorific value is derived from the gross by subtracting the heat of vaporization of the water in the fuel, *plus* that formed by the combustion of the hydrogen in the fuel. It is the net calorific value on the " as received " basis that relates to domestic heating, but it is rarely used due to the difficulty of determination and the necessity for ultimate analyses. The six average calorific values for the eight cokes tested are given in Table 2, all arranged in order of the " as received " values with the highest values in each column underlined. It is at once seen that the order would be entirely changed if based on either the " dry " or the " dry ash-free " values.

TABLE 2.—*Calorific Values of Cokes.*

[Highest values in each column underlined.]

	As Received.		Dry.		Dry, Ash-Free.	
	Gross.	Net.	Gross.	Net.	Gross.	Net.
Vertical retort, large .	12 420	12.330	12,860	12 800	14 140	14,070
Metallurgical No. 2 .	12.320	12,220	12,760	12,690	14,190	14,110
By-product No. 2 . .	12,130	12,020	12.750	12,690	14,130	14,060
Metallurgical No. 1 .	12 060	11.950	12.860	12 790	14.100	14.020
Vertical retort, small .	12,050	11,920	12 980	12.910	14.140	14,060
Horizontal retort, small	11.490	11.310	12.750	12 670	14.110	14,020
Horizontal retort, large	11,280	11 090	12.950	12,890	14 180	14,110
By-product No. 1 . .	10 810	10,600	12,860	12,780	14 220	14.130

Combustibility.

The relation between the rate of combustion of coke and the rate of air supply over a wide range is affected by very many physical and chemical properties, and was found to vary a great deal among the cokes investigated. Some were so combustible that the ordinary range of draughts available in the average domestic heating furnace was too great for them. Others were found to be so non-combustible that satisfactory operation was impossible. In general the more porous cokes were the more combustible, but there were big differences between the combustibilities of cokes of nearly the same physical characteristics which could not be explained on the basis of any of the measurements made in this investigation.

IV.—Physical Properties.

Densities.

The density of coke may be expressed in three ways—viz., the true specific gravity of the solid material, the apparent specific gravity of the coke lump containing a proportion of air, and the bulk density or weight of the lumps contained in a cubic foot. From the true and apparent specific gravities may be derived the porosity or volume of cell space of the coke, which combined with the packing characteristics of the pieces fixes the bulk density. A cubic foot of coke is made up on the average of about 20% solid matter, 25% air in the particles, and 55% air between the lumps. When the bulk density is multiplied by the calorific value the very important but rarely used " bulk calorific value " is obtained. This value is the best criterion of the effect of density upon the usefulness of a fuel, as it shows the relation between the volumes of various fuels which must be charged into the furnace to supply a given amount of heat for a given time (see fig. 6). The average number of B.Th.U. per cubic foot of coke is about half that of anthracite, and as the householder is accustomed to charging a certain volume of fuel in his furnace, this causes most of the difficulties he encounters in changing from anthracite to coke.

In a good many domestic furnaces the fire-pot is of such a size relative to the rest of the system that a premium is placed on high bulk density. Where the fire-pot is much too small, coke may be used only if its more rapid output of heat is considered sufficiently desirable to offset the increased frequency of charging required. In large fire-pots the quantity of fuel that can be charged is limited by the time taken thereafter for the fire to attain the desired rate of heat output. As coke " picks up " much more rapidly than anthracite, a greater volume can be fired at one time without seriously damping the fire, so that the number of heat units it is convenient to charge is about the same with either anthracite or coke.

Sizing of Coke.

In practically all publications containing instructions for the burning of coke, and in many papers dealing with its preparation for the domestic market, the statement is made that the coke should be uniformly of the most suitable size. Seldom are recommendations included as to what sizes are to be considered suitable for furnaces of various types, and when such recommendations are sought there appears to be a considerable divergence of opinion in the matter. Most investigators agree that within the practical limits imposed by existing equipment, the smaller the size of the coke the more easily is the fire controlled. In addition, our investigations showed that quite generally the smaller sizes of coke are burned more efficiently. Hot air furnaces and the smaller hot water furnaces where the fire-pot is surrounded by a water jacket and surmounted by a radiation dome depend mainly upon heat that is transmitted through the walls of the fire-pot. In all furnaces, then, it is of advantage to have the incandescent fuel as close as possible to the fire-pot walls. With the larger sizes of coke commonly sold for furnace use it is only by running a very hot fire that the outside pieces may be completely burned. Under ordinary firing conditions they pass down through the fuel bed and grates unburned. Quite often the refuse in the ash pit consists of an inner circle of ash surrounded by a ring of unburned or partially burned coke, thus necessitating sifting the ashes to avoid considerable waste. This is not so noticeable in stoves,

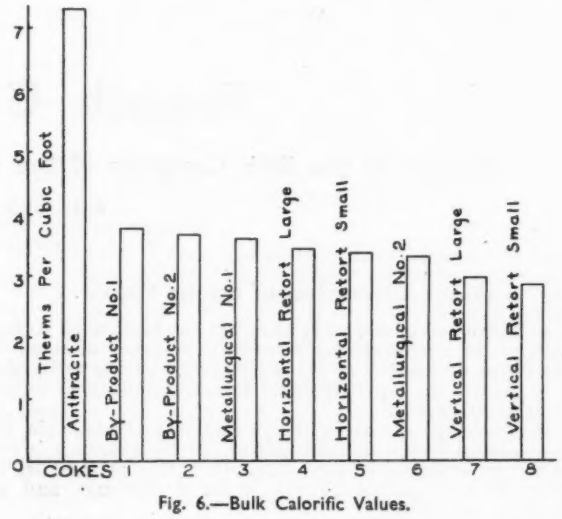


Fig. 6.—Bulk Calorific Values.

where the fire-pot walls are relatively hot, but wherever it happens the effective grate area and hence the volume of the fire-pot is decreased, thus intensifying the disadvantage of low bulk density in small furnaces. This condition can be observed in burning most of the sizes of coke sold for furnace use in Toronto, and consequently these sizes are

considered to be too large. There appears to be no advantage in using a fuel any larger than is necessary for it to be retained on the grates. Less draught is required for burning larger sizes, but domestic furnaces have been designed for anthracite and most of them have available a much larger draught than is necessary for burning coke. In the few cases where there is insufficient draught for coke the design of flues and chimneys is at fault, and this condition cannot be remedied by a change of fuel properties.

The sizing of coke may be discussed from another standpoint. It is not apparent why coke should be uniformly sized except to avoid segregation of sizes in the bin. Non-uniformity of the fire, channeling, &c., which are objections to a poorly sized anthracite or other dense fuel, do not apply to the same extent to coke, the greater thickness of the fuel bed tending to avoid such conditions. Investigations at the University of Illinois Engineering Experiment Station[2] have shown that while industrial boilers give a higher maximum output with sized fuel there is no gain in efficiency over unsized fuel. The ability to attain maximum output is not so important in a domestic furnace, as the maximum combustion rate is never deliberately approached when burning coke. On the other hand, a number of particles all of the same size have the lowest bulk density possible with any one material. Incorporation of different sizes in correct proportion raises the bulk density by filling more of the voids between the pieces and approximating more and more closely the apparent specific gravity of the particles themselves. As an example the bulk density of a coke sample averaging 1½ in. may be raised by 15% by the incorporation of half its volume of small coke averaging ¾ in.

Strength of Coke.

The standard shatter test for coke gives a measure of the breakage that may be expected to occur in handling the coke about the plant in chutes, conveyors, &c., but gives little information as to how that coke is going to behave in a cellar. When dropped from a height on to an iron plate a light, weak coke shows no more degradation than a dense strong coke. It is obvious that such a test tells nothing about whether a piece of coke will powder under foot or whether it will remain intact at the bottom of a deep pile. The domestic user is interested in the crushing strength of the coke, as a weak coke gives him dirty floors and much dust. Degradation in size when handled is not an objection except in so far as it produces fines and breeze.

The Advantages and Disadvantages of Coke in Comparison with Anthracite.

Advantages—

(1) Greater combustibility. This results in shorter pick-up time and makes available a greater range of combustion rates.
(2) Greater thermal efficiency, due to a much smaller loss of carbon to ash than with U.S. anthracite, and to a lower volatile matter content than British anthracite.
(3) The supply of coke has been more regular, and since it is a manufactured article rather than a natural product, the quality of coke, with the exception of the moisture content, has been more consistent.
(4) It is more easily handled from the standpoint of weight on the shovel.

Disadvantages—

(1) Low bulk calorific value, which shortens firing intervals in under-sized furnaces and increases the storage space necessary.
(2) High ash content in comparison with British anthracite.
(3) Some cokes have excessive moisture contents and show large variation in moisture content from month to month.
(4) Cokes show great differences in strength, the weakness of some of them causing annoyance to the domestic user due to excessive powdering and consequently dirty furnace operation. British anthracite possesses this disadvantage also.
(5) The sizes at present supplied are too large.

Three of these disadvantages can be controlled without interfering with manufacturing processes. The bulk calorific value may be increased by the mixing of sizes in correct proportion, excessive moisture may be avoided, and size may be reduced by cutting. Ash content and strength are beyond the sphere of coke preparation. There is often included among the disadvantages of coke the necessity of more frequent charging. If due regard is paid by the operator to the volume relationships between coke and anthracite, this is true only in the case of under-sized furnaces. On a weight basis coke will outlast anthracite by a comfortable margin under the same conditions of heat output if the best firing procedure is used in each case. It is quite possible in an average furnace to maintain a slow coke fire untouched for seventy-two hours.

Arranged in order of increasing divergence from the characteristics of anthracite, the various types of coke are (1) metallurgical coke, (2) by-product oven coke, (3) horizontal gas retort coke, (4) vertical gas retort coke. The degree to which each kind of coke possesses the above advantages and disadvantages, with the exception of ash and moisture contents, follows the same order. That is, gas house coke is the most combustible, flexible, and efficient of the cokes, but at the same time is also the weakest and the most bulky. All these factors are dependent on the density of the coke more than on any other property; consequently low density may be classed either as desirable or the reverse, depending finally upon the characteristics of the equipment in which the fuel is to be burned.

REFERENCES.

[1] Report of the Fuel Research Board for the year ended March 31, 1935. His Majesty's Stationery Office, London.

[2] A. Kratz and W. J. Woodruff—"Combustion Tests with Illinois Coals," Bul. No. 213, Univ. Illinois Eng. Exp. Station.

French Gas Industry

Review of the 58th Congress of the Union Syndicale de l'Industrie Technique du Gaz en France

(*Continued from p. 222.*)

Direct Production of Strong Liquor.

A. Bolzinger pointed out that the production of strong liquor is an advantage since it effects economy of steam if the liquor is distilled on the works and a saving in freight is realized if the liquor is sold. In addition, smaller liquor wells are required.

He described a system of gas cooling and ammonia recovery whereby the greater portion of the ammonia is obtained as a liquor of high strength. The method is, in part, a development of the work of Hollings and of Hollings and Silver.

The aim is to secure about 4-4·5 gallons of high strength liquor per ton of coal carbonized, the remaining water obtained from the coal (moisture, water of decomposition and undecomposed steam if steaming is practised) being discarded in the form of a weak liquor.

To this end the gas is liquor sprayed with a mixture of circulating liquor *plus* condensate from the second half of the two-stage primary cooler *plus* condensate from the secondary cooler. In the first half of the primary cooler, which cools the gas to about 65° C., a very weak liquor is obtained. The major part of this is run to waste and an amount equal to 4-4·5 gallons per ton of coal is cooled and supplied to the ammonia scrubbers. This represents the only liquid supplied to the scrubbers. The second stage of the primary coolers reduces the gas temperature to 30° C., final cooling to 15° C. being effected in the secondary cooler after the gas has passed a centrifugal tar extractor.

The gas passing to the primary cooler contains 2-3 times as much ammonia as corresponds to the ammonia content of the gas leaving the carbonizing plant, this being due to the intensive liquor circulation adopted and to the inclusion of condensates from the coolers with the circulating liquor. Temperature conditions are so adjusted that upwards of 66% and, in fact, as much as possible of the ammonia evolved from the coal is present in the gas entering the ammonia scrubbers.

A practical realization of the method is described, the plant in question being thermostatically controlled by

means of servo-motors which control the valves supplying water to the separate halves of the primary cooler and thereby regulate the temperature of the gas entering and leaving the second stage of the primary cooler.

The ammonia scrubber consists of a Livesey washer followed by a 12-compartment Holmes washer in two sections. The Holmes washer is provided with gilled cooling pipes serving to remove the large quantity of heat liberated during the solution of the ammonia with formation of a strong liquor.

A blend of Durham coals is carbonized in intermittent chambers, steam to the extent of 4% of the coal being continuously passed through the chambers to act as a scouring medium. Of the steam, about 10% is decomposed, decomposition occurring only in the final stages of carbonization.

The coal employed yields 5·6 lb. of ammonia per ton. The liquor rejected from the first half of the primary cooler amounted to approximately 13 gallons of 3-oz. liquor per ton of coal carbonized and the strong liquor obtained from the scrubbers amounted to 4·4 gallons and was of 40-oz. strength. These two amounts should, ideally, contain all the ammonia yielded by the coal but, in practice, this was not the case since some liquor was contained in the tar and, in addition, condensates from the gas mains were not brought into the circulatory system. Moreover, 8 grains of ammonia per 100 cu.ft. were left in the gas and some losses occurred. For this reason, the maximum potential concentration of ammonia in the gas reaching the scrubbers was not obtained. If all possible liquor were returned to the circulatory system it should, theoretically, be possible to recover as much as 4·4 gallons of 50-oz. liquor and to reject 13 gallons of 2-oz. liquor.

It must be pointed out that the coal employed was low in chlorine. Had this not been the case, more ammonia would have been rejected with the weak liquor.

Thermostatic Control of Gas-Fired Central Heating Plant.

M. Davoust gave an account of an investigation carried out at Clermont with a view to the establishment of the conditions under which gas can compete with anthracite or coke as a fuel for the central heating plant of large residences. He combats the often expressed idea that gas is a suitable and practical fuel but is prohibitive in price save in special instances. It is shown that gas can prove economical in what is generally regarded as an example of one of the most unfavourable cases for the use of gas—namely, that of a large villa.

The following conclusions are drawn from the investigation:

(1) If the installation is not provided with a room thermostat or with a time switch for cutting off the gas supply to the central heating plant at night or day, as the case may be, the generally accepted equivalence of gas and solid fuel holds good—namely,
1,000 cu.ft. of 506 B.Th.U. gas = 62-66 lb. of solid fuel.

(2) If a room thermostat is fitted but there is no time switch,
1,000 cu.ft. of gas = 72-75 lb. of solid fuel.

(3) If room thermostats and time switches are fitted and separate boilers feed the radiators of the living and sleeping quarters,
1,000 cu.ft. of gas = 100-119 lb. of solid fuel.

In the last case, central heating by gas becomes cheaper at Clermont than central heating by means of a true anthracite if account is taken of the labour costs attending the use of solid fuel. Under these conditions, also, gas heating is even cheaper than heating by use of a local semi-anthracite.

It is necessary that gas boilers are well insulated and that the burners are flexible and well adapted to regulation over a wide range and to operation by means of time switches.

As a result of the adoption of the implications of the above conclusions, numerous installations of gas-fired central heating plants have been supplied in Clermont in a short space of time and the new clients are enthusiastic advocates of gas heating. This is particularly beneficial to the gas undertaking since its winter load is smaller than its summer load.

Gas in Biscuit Factories.

According to A. Gosselain, the seventy-five biscuit factories of the Paris district are potential consumers of 250-280 million cu.ft. of town gas per annum. At present, however, the consumption is only one-fourth of this quantity and the majority of the remainder of the fuel employed is producer gas, there being also a little solid fuel in use. In France there are nearly 1,000 biscuit factories.

M. Gosselain described a number of different types of gas-fired ovens employed for the manufacture of biscuits and wafers.

In shelf ovens the consumption of gas per pound of biscuits is larger than that of chain-guided tunnel ovens though shelf ovens are more flexible and can be used for a large variety of biscuits as well as for pastries.

In the case of chain-driven tunnel ovens, the trays travel on endless chains. The first ovens of this type were brick built and showed a gas consumption of 11-13 cu.ft. of gas per pound of biscuits. Nowadays, the tunnel is lined with refractory materials, is well insulated, and is encased in metal. The consequent lightness of the structure enables such ovens to be installed in upper floors. The ovens are built up of units and may be from 20 to 66 ft. long. In their width from one to four chains may be fitted. These can be arranged with independent drives enabling several types of biscuit to be made at a time if the rates of travel are suitably and independently adjusted.

It is desirable that the burner connections be flexible so that thermal expansion of the oven is accommodated. With an oven having an output of two hundredweight of biscuits per hour, the gas consumption is as low as 2·4 to 2·9 cu.ft. of gas of 506 B.Th.U. quality per pound of biscuits. The gas consumption varies with the type of biscuit.

An English oven of this type, though of a more expensive construction, has a gas consumption as low as 2¼ cu.ft. of gas per pound of biscuits and the heat lost in the waste gas is only 21%.

In the case of very large factories, travelling-band ovens are employed, the output being 2 cwt. per hour for a band 19¾ in. wide. The gas consumption should not exceed 2·4 cu.ft. per pound of biscuits.

Several forms of ovens are available for the manufacture of wafers. The gas consumption is high—namely, 16 cu.ft. per pound of wafers, but it must be borne in mind that the wafer mixture contains a high proportion (60%) of moisture. A heat balance on a wafer oven showed a useful heat of 28%, the waste gas loss being 60% and the radiation and convection loss 12%.

French biscuit ovens are nearly as good as their English analogues from the point of view of efficiency. Much, however, remains to be done as regards the design of the burner equipment of wafer ovens. The tendency is to devote particular attention to the design of the mechanical parts of the oven and to neglect the heating aspect.

(*To be continued.*)

Further Gas Undertakings' Results

Berwick and Tweedmouth.

At the annual meeting of shareholders of the Berwick and Tweedmouth Gas Company, Mr. H. R. Peters presiding, it was reported that the Company intended to remodel their existing premises in Bridge Street, and have constructed an up-to-date showroom for the Company's exhibits. It was also reported that the cost of the new gasholder which has been constructed at Spittal this year had been paid for out of profits and is also to be capitalized and every shareholder is to receive one share for every five held in the Company. The fractions left over are to be sold and the amount realized is to be distributed amongst shareholders in proportion. The Chairman, in moving the adoption of the annual report, said the Company had experienced a very satisfactory year. The profit was £2,023, which, added to the amount brought forward, made a total of £3,028. Out of this it was proposed to pay a dividend of 5½%.

Elie and Earlsferry.

The Directors of Elie and Earlsferry Gas Company, Ltd, have recommended payment of a dividend of 6%, less tax, on the ordinary shares. From gas sold and rent of meters £2,492 was drawn last year. Sale of cookers fetched £199 and sale of coke and tar £400. Coal and carriage expenditure was £1,134, salaries and wages took £646, repairs and maintenance absorbed £135, and £365 was spent on purchase and repair of meters and cookers, leaving a net profit for the year of £317.

Galston.

At the annual meeting of shareholders of Galston Gas Company the report showed that there was an increase of 220,000 cu.ft. in the output during the past year. The Directors recommended a dividend of 9%, less tax.

Sedgley.

The balance-sheet of the Sedgley (Staffs.) Urban District Council Gas Undertaking shows that in the year ended March 31 last there was a net profit of £2,531, compared with £2,181 in the previous year. The Gas Committee recommends the allocation of £1,000 of this profit towards the cost of laying out and equipping playing fields and open spaces in the urban district.

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Gas Markets and Manufactures

Stock Market Report

(For Stock and Share List, see later page)

Business on the Stock Exchange was again on a reduced scale, the Foreign Exchange market being partly responsible for some uneasiness, though prices remained firm in most sections. Gilt-edged and some of the leading industrials continue to be bought for investment, and there were a few bright features among oils and rubbers. Apart from Foreign Bonds the only real weak spot was the Home Rail market, which was adversely affected by the somewhat pessimistic half-yearly announcements.

The Gas Market was comparatively well supported with prices showing a hardening tendency, though it will be seen in the Stock and Share List that very few quotations were altered. More half-yearly or interim dividend announcements were made during the week, and the Directors of the Gas Light and Coke Company in declaring the usual rates, including that of £2 16s.% on the ordinary stock, issued a most encouraging statement of the Company's increased business during the period, an innovation which might well be followed by other gas undertakings. The Cardiff Company is paying 3%; Croydon 2½% on the maximum stock and 3½% on the sliding-scale stock; South Metropolitan 2½%; South Suburban 3%; Tottenham £3 7s. 6d.%; and Wandsworth 3½%; all of which rates are the same as those paid for the corresponding period of 1934.

Current Sales of Gas Products

The London Market for Tar Products.

July 29.

Prices of tar products remain as quoted on the 22nd inst., namely:

Pitch is nominal at 35s. per ton f.o.b.

Creosote, about 6d. per gallon.

Refined tar, 4d. per gallon in bulk at makers' works.

Pure toluole, 2s. 2d. to 2s. 3d.; pure benzole, 1s. 7d. to 1s. 8d.; 95/160 solvent naphtha, 1s. 5d.; and 90/160 pyridine, about 4s. 6d. to 4s. 9d.—all per gallon naked at makers' works.

Tar Products in the Provinces.

July 27.

The average prices of gas-works products during the week were: Gas-works tar, 18s. to 23s. Pitch—East Coast, 31s. to 33s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 31s. to 33s.* Toluole, naked, North, 1s. 8d. to 1s. 9d. Coal-tar crude naphtha, in bulk, North, 6¾d. to 7d. Solvent naphtha, naked, North, 1s. 5d. to 1s. 5½d. Heavy naphtha, North, 9½d. to 10½d. Creosote, *ex* works, in bulk, North, liquid and salty, 5½d. to 5¾d.; low gravity, 5d. to 5½d.: Scotland, 5d. to 5½d. Heavy oils, in bulk, North, 5d. to 5½d. Carbolic acid, 60's, 1s. 11d. to 2s. Naphthalene, £10 to £11. Salts, 60s. to 75s., bags included. Anthracene, "A" quality, 2½d. to 3d. per minimum 40%, purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *July* 27.

The holiday feeling is still predominant and new business is practically at a stand-still. Quotations are unchanged.

Crude gas-works tar.—The actual value is 28s. to 30s. per ton *ex* works in bulk.

Pitch remains without interest at 35s. per ton f.o.b. Glasgow for export, and 35s. per ton *ex* works in bulk for home trade.

Refined tar is available to all at 3d. per gallon *ex* works in buyers' packages.

Creosote oil is well looked after with prompt supplies scarce. B.E.S.A. Specification, 5½d. to 5⅝d. per gallon; low gravity, 5¼d. to 5½d. per gallon; and neutral oil, 5¼d. to 5½d. per gallon; all f.o.r. in bulk.

Cresylic acid is a dull feature but prices are being maintained as under: Pale, 97/99%, 1s. 1½d. to 1s. 2½d. per gallon; dark, 97/99%, 1s. to 1s. 0½d. per gallon; and pale, 99/100%, 1s. 2½d. to 1s. 3½d. per gallon; all *ex* works naked.

Crude naphtha commands 4½d. to 5d. per gallon, according to quality and district.

Solvent naphtha.—90/160 grade is 1s. 3½d. to 1s. 4d. per gallon, and 90/190 heavy naphtha is 10½d. to 11½d. per gallon.

Motor benzole is still commanding 1s. 3d. to 1s. 3½d. per gallon in bulk at makers' works.

Pyridines.—90/160 grade is 5s. 6d. to 6s. per gallon, and 90/140 grade 6s. to 6s. 6d. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s. d.		s. d.	
Crude benzole	0 9½	to	0 10	per gallon at works
Motor ,, ...	1 3	,,	1 3½	,, ,, ,,
90% ,, ...	1 4	,,	1 4½	,, ,, ,,
Pure ,, ...	1 7½	,,	1 8	,, ,, ,,

Contracts Advertised To-Day

Benzole Plant.

Halifax Gas Department. [p. 274.]

Coal.

Teignmouth Gas Department. [p. 274.]

Trade Notes

Change of Address.

Metropolitan-Vickers Electrical Co., Ltd., inform us that on and from Aug. 6, 1935, their London office address will be 1, Kingsway, W.C. 2. Telegraphic address: "Multiphase, Estrand, London." Their telephone number remains unchanged.

High Efficiency "Sinuflo" Boilers.

The exclusive rights for the patent "Sinuflo" super-economic boiler have been obtained by Messrs. Cochran & Co., Annan, Ltd., and they have forwarded us a copy of their leaflet No. 51 in which are to be found particulars of their latest production.

Electric Motors and Switchgear.

The Lancashire Dynamo and Crypto, Ltd., 94, Petty France, S.W. 1, have recently published a catalogue dealing with their squirrel cage and slip ring motors and electrical switchgear. This list is for A.C. equipment and should prove useful to gas engineers who receive their supply from an external source.

"Ideal" Domestic Boilers.

We have received from Ideal Boilers & Radiators, Ltd., Ideal House, Great Marlborough Street, W. 1, their leaflet giving particulars of a new small "Ideal" domestic boiler for hot water supply. The boiler has a large fuel capacity for its size and the body can be supplied rustless for soft water districts.

The Vulcan Stove Company's New Representative.

We are informed by the Vulcan Stove Company, Ltd., that Mr. J. J. Sanders, who has represented them in the south-east of England for the past 22 years, is about to relinquish the more active duties which this entails and while they will still retain him in a consultative capacity, Mr. J. S. Browne has joined the firm as representative in that area.

"Our Works and Products."

A comprehensive publication has been forwarded to us by J. Browett Lindley (1931), Ltd., Coborn Works, Letchworth, Herts., giving a survey of their range of manufactures and the works in which they are made. The publication "Our Works and Products" is not a catalogue in the ordinary sense and it should prove of more than ordinary interest to our readers.

Piggott's Pressed Steel Tanks.

The new pressed steel tank catalogue of Horseley Bridge & Thomas Piggott, Ltd., Horseley Works, Tipton, has recently been forwarded to us by the firm. These tanks are constructed of interchangeable plates to user's requirements. In compiling the catalogue every endeavour has been made to make it more than just a record of their manufactures and the tables and dates included in the publication will, it is hoped, fill a long-felt want in the Gas Industry.

For increased efficiency in every process related to gas manufacture . . . .

THE WEST SYSTEMS

OF CARBONIZATION, FUEL-HANDLING AND TREATMENT

The West organization has co-operated with leading gas undertakings of 22 countries in schemes of modernization, plant renewal and extension. Most of the world's principal gas coals have been treated in our Research Gas Works

GLOVER-WEST VERTICAL RETORTS

WESTVERTICAL CARBONIZING CHAMBERS

A MEMBER COMPANY OF THE SOCIETY OF BRITISH GAS INDUSTRIES · 1905 ·

BREEZE-BURNING PRODUCERS AND WASTE-HEAT RECOVERY PLANT
MODERN METHODS OF COAL & COKE HANDLING & TREATMENT

WEST'S GAS IMPROVEMENT COMPANY, LTD.

MANCHESTER: Albion Ironworks, Miles Platting. LONDON: Regent House, Kingsway, W.C.2

STOCK AND SHARE LIST

Official Quotations on the London and Provincial Stock Exchanges

Issue. £	Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations, July 26.	Rise or Fall on Week.	Transactions, Lowest and Highest Prices During the Week.
1,551,868	Stk.	Mar. 11	7	7	Alliance & Dublin Ord. ...	130—140	...	138
374,000	,,	June 24	4	4	Do. 4 p.c. Deb. ...	90—100	...	...
557,655	,,	Feb. 18	7	7	Barnet Ord. 7 p.c.	165—170	...	...
300,000	1	Apl. 8	1/4½	1.9½	Bombay, Ltd.	1 7/16—1 11/16	...	32/—32/2½
178,480	Stk.	Feb. 18	9½	9½	Bournemouth sliding scale ...	225—235	...	...
550,050	,,	,,	7	7	Do. 7 p.c. max. ...	168—173	...	169
489,160	,,	,,	6	6	Do. 6 p.c. Pref. ...	149—154	+2	151—153
50,000	,,	June 24	3	3	Do. 3 p.c. Deb. ...	85—90	...	...
262,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	106—111	...	107—108
335,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	123—128	...	127½
357,900	,,	Feb. 18	7½	7½	Brighton, &c., 6 p.c. Con. ...	173—178	...	177½
649,955	,,	,,	6½	6½	Do. 5 p.c. Con. ...	153—158	...	155
205,500	,,	,,	6	6	Do. 6 p.c. B. Pref.	145—150	...	...
1,487,500	,,	July 8	5	5	Bristol, 5 p.c. max.	120—123a	+½	...
120,420	,,	June 7	4	4	Do. 1st 4 p.c. Deb. ...	100½—102½a	...	...
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb. ...	100½—102½a	...	...
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	127—130a	...	...
855,000	,,	Mar. 11	7	8	British Ord.	153—158	...	153—157
100,000	,,	June 7	7	7	Do. 7 p.c. Pref.	160—165	...	...
350,000	,,	,,	5½	5½	Do. 5½ p.c. "B" Cum. Pref.	112—117	...	...
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...	...
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	109—114	...	...
200,000	,,	,,	...	17/6	Do. 3½ p.c. Red. Deb. ...	99—101	...	...
100,000	10	22 May '33	6	4	Cape Town, Ltd.	1—3	...	...
100,000	10	6 Nov.'33	4½	4½	Do. 4½ p.c. Pref. ...	1—3	...	...
150,000	Stk.	June 24	4½	4½	Do. 4½ p.c. Deb. ...	83—88	...	...
626,860	,,	July 22	6	6	Cardiff Con. Ord.	127—132*	−3	...
237,860	,,	June 7	5	5	Do. 5 p.c. Red. Deb.	107—112	...	...
157,150	,,	Feb. 4	5	6½	Chester 5 p.c. Ord.	111—116b	...	...
98,936	1	Mar. 25	2/-	2/-	Colombo, Ltd., Ord.	1⅛—1⅛	...	...
24,500	1	,,	1/4½	1/4½	Do. 7 p.c. Pref. ...	20 6—22/6	...	...
609,204	1	Mar. 25	-/11·48	-/11·48	Colonial Gas Assn. Ltd. Ord.	20 6—22/6	...	...
296,053	1	,,	1/3·30	1/3·30	Do. 8 p.c. Pref.	26/—28/-	...	26/10½—27/1½
1,775,005	Stk	Feb. 4	5	6	Commercial Ord.	104—109	...	105
620,000	,,	June 7	3	3	Do. 3 p.c. Deb. ...	85—90	...	88—89
286,344	,,	Feb. 18	5	5	Do. 5 p.c. Deb. ...	123—128	...	...
807,560	,,	Feb. 18	7	7	Croydon sliding scale... ...	155—160	...	157
569,590	,,	,,	5	5	Do. max. div.	115—120	...	...
620,385	,,	June 24	5	5	Do. 5 p.c. Deb.	123—128	...	...
542,270	,,	Feb. 18	7	10	Derby Con.	185—195c	...	...
55,000	,,	June 24	4	4	Do. 4 p.c. Deb.	100—105c	...	...
239,000	,,	Feb. 4	5	5	East Hull Ord. 5 p.c. ...	108—113	...	...
181,625	,,	Feb. 4	6	6	East Surrey Ord 5 p.c. ...	131—136	...	...
175,609	,,	June 7	5	5	Do. 5 p.c. Deb. ...	123—128	...	...
1,002,180	,,	Mar. 11	†	17	European, Ltd.	170—180	..	...
19,313,481	,,	Feb. 4	5½	5½	Gas Light & Coke 4 p.c. Ord.	28/—28 6f	...	28/—28/6
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	89—92	...	90½
4,477 106	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	108—111	...	109½—110
8,602,497	,,	June 7	3	3	Do. 3 p.c. Con. Deb. ...	89—92	...	90—91½
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	115—118	...	116½—118
3,500,000	,,	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	112—115	...	...
270,466	,,	Feb. 18	6	6	Harrogate New Cons. ...	135—140	...	...
140,000	1	Mar. 25	1/7½	1/7½	Hongkong & China, Ltd. ...	1½—1¾	...	26 6—27/-
213,200	Stk.	Feb. 18	6	6	Hornsey Con. 3½ p.c....	128—138	...	...
5,600,000	,,	May 13	10	14	Imperial Continental Cap. ...	215—220	...	216—218½
223,130	,,	July 22	3½	3½	Do. 3½ p.c. Red. Debs.	90—95*	−1	...
285,242	,,	Feb. 18	8½	8½	Lea Bridge 5 p.c. Ord. ...	175—185	...	...
2,167,410	,,	Feb. 18	6	6	Liverpool 5 p.c. Ord.... ...	139—141b	+1	...
245,500	,,	June 7	5	5	Do. 5 p.c. Red. Pref. ...	105—110b	...	...
306,083	,,	July 8	4	4	Do. 4 p.c. Deb.	103—106b	...	...
165,736	,,	Feb. 18	8	10	Maidstone 5 p.c. Cap. ...	185—195	...	...
63,480	,,	June 24	3	3	Do. 3 p.c. Deb. ...	82—87	...	...
75,000	,,	May 27	†10	†10	Malta & Mediterranean ...	212—222	...	...
392.000	—	Apl. 1	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	100—105	...	...
231,978	Stk.	Feb. 4	5	5	M. S. Utility "C" Cons. ...	110—115	...	...
818,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	102—107	...	...
360,075	,,	June 24	4	4	Do. 4 p.c. Deb. ...	103—108	...	...
148,955	,,	,,	5	†5	Do. 5 p.c. Deb. ...	123—128	...	...
125,000	—	July 1	3½	3½	Do. 3½ p.c. Rd. Rg. Bds.	97—100	...	100½
675,000	,,	June 24	†3	†3	Montevideo, Ltd.	48—58	...	52½
2,061,315	,,	Feb. 18	5	5½	Newcastle & Gateshead Con.	25 6—26/6df	...	...
682,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	106—107d	...	...
776,706	,,	June 7	3½	3½	Do. 3½ p.c. Deb. ...	99—101d	...	...
277,285	,,	Oct. 8	5	5	Do. 5 p.c. Deb. '43 ...	105—107d	...	...
274,000	,,	Feb. 4	5	5	Newport (Mon.) 5 p.c. max....	115—120a	...	...
225,000	,,	Feb. 18	7½	7½	North Middlesex 6 p.c. Con.	165—175	...	...
396,160	,,	Feb. 4	5	5	Northampton 5 p.c. max. ...	105—110	...	...
300,000	,,	Apl. 29	†9	†7	Oriental, Ltd.	167—172	...	170½—172
416,617	,,	June 7	8	8	Plym'th & Stonehouse 5 p.c.	162—167	...	...
504,416	,,	Feb. 4	8	8½	Portsm'th Con. Stk. 4 p.c. Std.	173—178	...	...
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	110—115	...	...
114,000	,,	July 22	5	5	Preston 5 p.c. Pref.	106—111*	−2	...
321,961	1	Apl. 8	...	...	Severn Val. Gas Cor. Ld. Ord.	22/—23/-	...	22/—23/-
319,510	1	Mar. 25	...	...	,, ,, 4½ p.c. Cum. Pref.	22 —23/-	...	...
1,736,968	Stk.	Feb. 18	6	6	Sheffield Cons.	141—143e	...	...
95,000	,,	June 24	4	4	Do. 4 p.c. Deb.	102—104e	...	...
133,201	,,	Feb. 18	8½	5	Shrewsbury 5 p.c. Ord.	142—147	...	...
90,000	10	May 27	‡3	‡3½	South African	3—4	...	...
1,061,779	1	May 13	1/2½	1 2½	South East'n Gas Cn. Ld. Ord.	27/—29/-	...	28/3—28 10½
845,016	1	Mar. 11	-/10½	- 10½	Do. 4½ p.c. Red. Cum. Pref.	22/3—23/3	...	22/10½—23/1½
450,000	Stk.	Feb. 4	74/4	4	Do. 4 p.c. Red. Deb. ...	100—103	...	...
6,709,895	,,	Feb. 4	5	6½	South Met. Ord.	125—128	+1	124—128
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf. ...	147—152	...	150 - 151
850,000	,,	,,	4	4	Do. 4 p.c. Irred. Pf. ...	107—110	...	108½—110
1,895,445	,,	June 24	3	3	Do. 3 p.c. Deb. ...	87—90	...	88½—89½
1,000,000	,,	July 8	5	5	Do. 5 p.c. Red. Deb....	112—117	...	...
209,820	,,	Feb. 18	8½	8½	South Shields Con.	174—176d	...	...
1,543,795	,,	Feb. 18	6	6	South Suburban Ord 5 p.c. ...	130—135	...	132
512,825	,,	,,	5	5	Do. 5 p.c. Pref. ...	121—126	...	...
500,000	,,	,,	4	4	Do. 4 p.c. Pref. ...	105—110	..	108½
888,587	,,	June 7	5	5	Do. 5 p.c. Deb. ...	123—128	...	...
250,000	,,	,,	4	4	Do. 4 p.c. Deb. ...	105—110	...	...
647,740	,,	Feb. 4	5	5	Southampt'n Ord. 5 p.c. max.	116—121	...	120
121,275	,,	June 7	4	4	Do. 4 p.c. Deb.	100—105	...	...
350,000	,,	Feb. 4	5½	5½	Swansea 5½ p.c. Red. Pref. ...	115—120	...	115½—117½
200,000	,,	June 7	6½	6½	Do. 6½ p.c. Red. Deb. ...	98—103	...	...
1,076,490	,,	Feb. 18	6½	6½	Tottenham and District Ord.	148—153	...	151½—152
409,835	,,	,,	5½	5½	Do. 5½ p.c. Pref. ...	131—136	...	134—136
62,235	,,	,,	5	5	Do. 5 p.c. Pref. ...	120—125	...	...
334,615	,,	June 7	4	4	Do. 4 p.c. Deb. ...	101—106	...	105½
369,774	,,	Feb. 4	7	7	Uxbridge, &c., 5 p.c.	150—155	...	152—154½
108,330	,,	,,	5	5	Do. 5 p.c. Pref. ...	118—123	...	124½
1,326,700	,,	Feb. 4	7	7	Wandsworth Consolidated ...	157—162	+2	150—161
1,371 373	,,	,,	5	5	Do. 5 p.c. Pref. ...	121—126	...	124—125
1,317,964	,,	June 7	5	5	Do. 5 p.c. Deb. ...	125—130	...	...
338,300	,,	,,	26/8	4	Do. 4 p.c. Deb. ...	102—107	...	...
158,400	,,	Feb. 18	5	6g	Winchester W.& G. 5 p.c. Con.	116—121	...	...

Quotations at :—a.—Bristol. b.—Liverpool. c.—Nottingham. d.—Newcastle. e.—Sheffield. f.—The quotation is per £1 of Stock. g.—Paid £3, including 10s. on account of back dividends. * Ex. div. † Paid free of income-tax. ‡ For year.

COMPANY NOTICES.

HORNSEY GAS COMPANY.

NOTICE is Hereby Given that the TRANSFER BOOKS relating to the ORDINARY STOCK of this Company WILL BE CLOSED on the 9th August, 1935, and re-opened on the 23rd August, 1935.

By order of the Board,
K. LESLIE MORTIMORE,
General Manager and Secretary.

General Manager and Secretary's Office,
Gas-Works,
Hornsey, N. 8,
July 31, 1935.

PLANT &c., FOR SALE & WANTED.

WANTED Urgently, Rotary Washing PLANT (Holmes type preferred), also LIVESEY WASHER, complete with connections, capacity 2 to 3 million c.ft. per day.

State full Particulars and Price to No. 8,557, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

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BRETTEL'S ESTATE
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Manufacturers of GAS RETORTS, GLASSHOUSE FURNACE & BLAST FURNACE BRICKS, LUMPS, TILES, and every Description of FIRE BRICKS.

Special Lumps, Tiles, and Bricks for Regenerative and Furnace Work.

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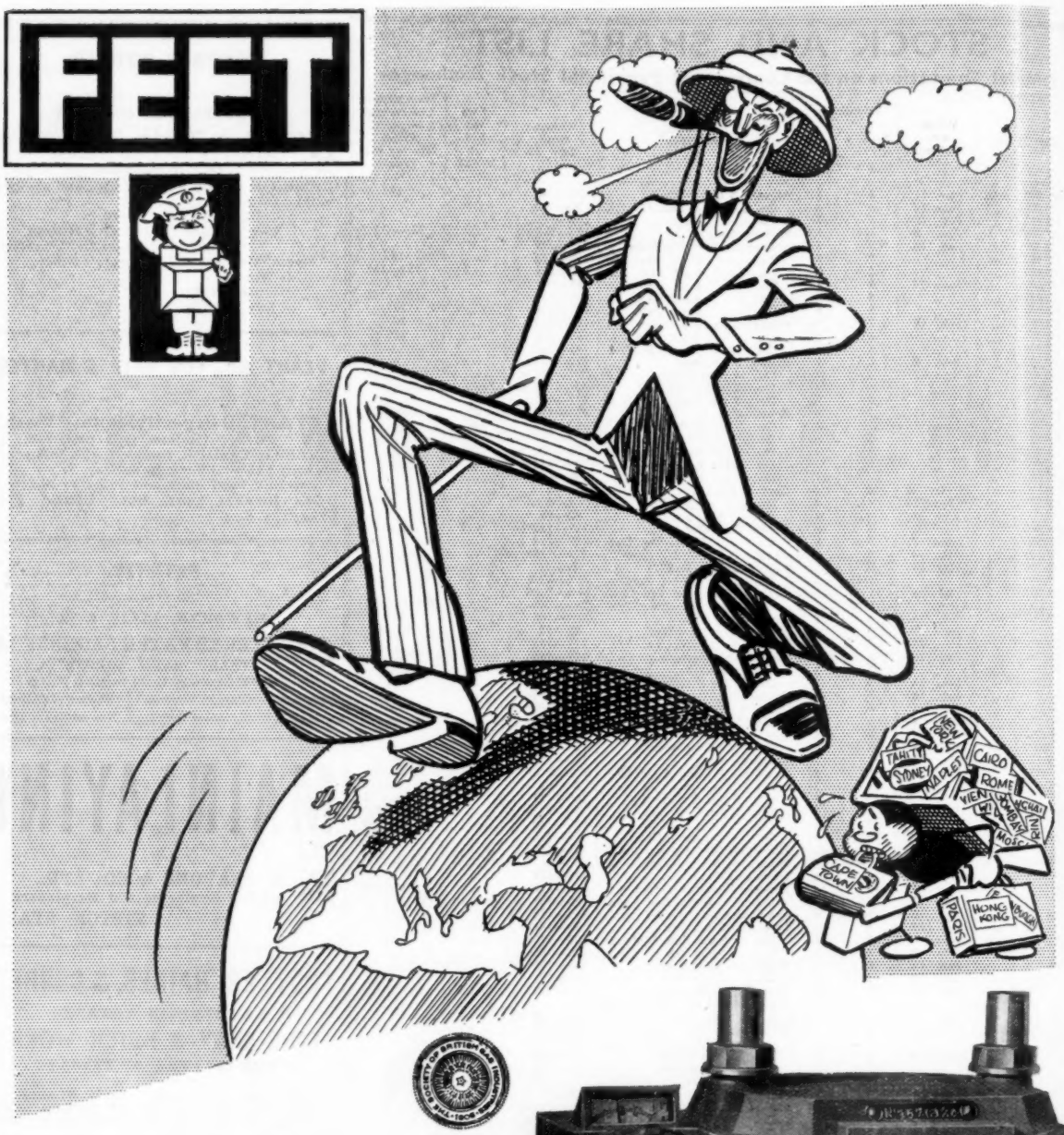
FEET



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"'YESSIR,' YOU FIND US EVERYWHERE—LIKE "A & M" METERS—FOR WHEN IT COMES TO THE MEASUREMENT OF CUBIC FEET OF GAS, BY GAD, SIR, THE SUN NEVER SETS ON "A & M" METERS"

ALDER & MACKAY LTD.

PUBLISHERS' NOTICE.

TO CORRESPONDENTS: No notice can be taken of anonymous communications, unless authenticated by the name and address of the writer (not necessarily for publication).

TO ADVERTISERS.

NOON ON TUESDAY is the latest hour for receipt of advertisement copy for the following day's issue.

FIRST POST ON MONDAY is the latest for receipt of alterations of standing advertisements.

RATES FOR UNDISPLAYED ADVERTS: Situations Wanted, Six Lines and under (about 36 words), 3s.; each additional Line, 6d. Situations Vacant, Apparatus Wanted and for Sale, Contracts, Public Notices, &c., 9d. per Line—minimum 4s. 6d. An additional charge of 6d. is made where replies are addressed c/o the "JOURNAL."

Full Schedule of Advertising Rates on application.

TERMS OF SUBSCRIPTION.

United Kingdom and Ireland	Advance Rate	35/- per annum. 18/- per half year.
	Credit Rate	40/- per annum. 21/- per half year.
Dominions and Colonies and United States		35/- per annum, in advance.
Other Countries in the Postal Union		40/- per annum, in advance.

A copy of the "G.J." Calendar and Directory is presented to Continuous Subscribers.

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OXIDE

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ESTABLISHED 1873

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Telegrams: "Purification, Stock, London." Telephone: London Wall 9144

J. & J. BRADDOCK (Branch of Meters Limited), Globe Meter Works, OLDHAM, and 45 & 47, Westminster Bridge Road, LONDON, S.E. 1.

WET AND DRY GAS METERS, PREPAYMENT METERS, STATION METERS AND GOVERNORS.

REPAIRS RECEIVE PROMPT ATTENTION.

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Telegrams: "BRADDOCK, OLDHAM," and "METRIQUE, LAMB, LONDON."

WEIGHBRIDGES

FOR Motor Lorries and Railway Traffic can be seen erected at our Works READY FOR DELIVERY. Inspection by your Engineer invited and a test by your Local Inspector of Weights and Measures before delivery. Every machine a High-Class Engineering Product and fully guaranteed.

CHARLES ROSS, LIMITED, SHEFFIELD.

OXIDE OF IRON.

SPENT OXIDE BOUGHT.

BALE & CHURCH, LTD., 33, ST. MARY-AT-HILL, LONDON, E.C. 3. Phone: Mansion House 1156.

"TORTO" FIRE CEMENT.

BALE & CHURCH, LTD., 33, ST. MARY-AT-HILL, LONDON, E.C. 3 Phone: Mansion House 1156.

"KLEENOFF," THE COOKER CLEANSER

Tins for Sale to Consumers. In Bulk for Works Use.

(*See also p. 166, July 17, and the "Gas Salesman."*)

BALE & CHURCH, LTD., 33, ST. MARY-AT HILL, LONDON, E.C. 3. Phone: Mansion House 1156.

This pre-cast Lead Ring

PATENT No. 404955
OTHER PATENTS PENDING

cuts out run lead and caulking

Using a spanner as his only tool, an unskilled workman can make the Stanton Mechanical Lead Joint in a fraction of the time which it takes a skilled hand to run lead into and caulk an open socket joint. A pre-cast lead ring is slipped over the spigot, two half-collars are placed in position, and the jointing operation is completed by the tightening of four cast-iron set-screws.

Inside the lead ring is cast a corrugated steel spring insertion ring, which uniformly distributes the end pressure so that the joint is effective throughout its full depth—and not for a portion only as in a caulked joint. The ring is mechanically held in position and cannot be dislodged by "drawing" of the spigot.

STANTON MECHANICAL LEAD JOINT

THE STANTON IRONWORKS COMPANY LIMITED, Nr. NOTTINGHAM

ROBERT DEMPSTER & SONS, LTD., ELLAND, Builders of CARBONIZING PLANTS, both Horizontal and Vertical. Manufacturers of CONDENSERS, PURIFIERS, GASHOLDERS, &c., also every description of COAL and COKE HANDLING PLANT. Telegrams: "DEMPSTER, ELLAND." Telephone: ELLAND 261 (Private Branch Exchange).

FIRTH BLAKELEY, SONS, & CO., LTD.,
Vulcan Ironworks, Church Fenton, Yorks.,
MANUFACTURERS of Gasholders, Tanks, Condensers, Purifiers, Scrubbers, Washers, and every description of Gas Plant.
Sole makers of the "P-M" Semi-water Gas Plant.
Telegrams: "BLAKELEYS, CHURCH FENTON." Telephone: BARKSTON ASH 34 (Private Branch Exchange). Code: "BENTLEYS."

STRACHAN & HENSHAW LTD.
MANUFACTURERS **BRISTOL.**
and CONTRACTORS for
HANDLING PLANT,
SCREENS, TIPPLERS, ETC.

APPOINTMENTS, &c., VACANT.

BUCKIE GAS LIGHT COMPANY, LIMITED.

APPLICATIONS are invited for the Position of ENGINEER AND MANAGER, including the duties of Collector and Treasurer. Salary, £350 per Annum, with free house, light, and fuel.

Applications, stating Age, and Experience in Manufacture and Sales of Gas, to be lodged with the undersigned, not later than Saturday, 10th August, 1935.

J. W. NAPIER,
Secretary.

Mansfield,
Alloa.

A well-established Firm of Gas Plant Makers, who are also actively engaged in the production of Chemical Gas Plant, requires the services of a keen capable man thoroughly well versed in the Technical and Practical aspects of this Special Branch, to take CONTROL of their CHEMICAL DEPARTMENT and its development.

Applications will be treated in confidence, and should state Age, Experience, and Salary required to No. 8,556, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C.4.

WANTED, by a large Gas Undertaking in the South, a CHIEF INSPECTOR of FITTINGS WORK. Must be fully qualified to Take Charge of the Fittings Department.

Applications, accompanied by *copies* of Testimonials, stating Age, Experience, Qualifications, and Salary required, to be sent, in applicant's own handwriting, to No. 8,552, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

WANTED, by a large Gas Undertaking in the South of England, a fully qualified MAINS SUPERINTENDENT, with Experience in High and Low Pressure Gas Distribution, and capable of Controlling the Main and Service Laying Departments.

Applications, stating Experience, Training, Age, present Employment, and Salary required, to be sent, in applicant's own handwriting, together with *copies* of recent Testimonials, to No. 8,553, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

COUNTY BOROUGH OF ROCHDALE.
(GAS DEPARTMENT.)

APPLICATIONS are invited for the Position of SALES MANAGER.

Applicants should preferably be holders of an Institution of Gas Engineers Certificate in Gas Supply, and the British Commercial Gas Association's Certificate in Gas Salesmanship, or equivalent qualifications and experience.

The duties of the Sales Manager will include management of the Showroom and the organisation of gas sales propaganda for domestic and industrial purposes. Salary, £350 per annum.

Applications, including *copies* of three recent Testimonials, endorsed "Sales Manager," and addressed to the undersigned, to be received not later than Thursday, August 8th, 1935.

By order,
WM. HENRY HICKSON,
Town Clerk.

Town Clerk's Office,
Town Hall, Rochdale,
July 19, 1935.

CONTRACTS OPEN.

TEIGNMOUTH U.D.C. GAS DEPARTMENT.

TENDERS FOR COAL.

TENDERS are invited for 6,000 Tons of COAL for the Gas-Works for 12 months, ending 30th September, 1936.

Tenders to be submitted for South Yorkshire or Durham Best Gas Coal, delivered f.o.r. Teignmouth.

Tenders to be delivered to the undersigned not later than first post August 26th, 1935, and enclosed in a plain sealed envelope bearing no name or mark indicating the sender, and endorsed "Gas Coal Tender."

Forms of Tender and further information can be obtained on application to the Gas Manager, Gas Office, Teignmouth.

The Council do not bind themselves to accept the lowest or any Tender.

W. T. WOODGATES,
Clerk to the Council.

Bitton House,
Teignmouth,
July, 1935.

COUNTY BOROUGH OF HALIFAX.
(GAS DEPARTMENT.)

BENZOLE PLANT.

THE Gas Committee of the Halifax Corporation invite TENDERS for the Supply, Delivery, and Erection of a BENZOLE PLANT to deal with a maximum of five million cubic feet of gas per diem.

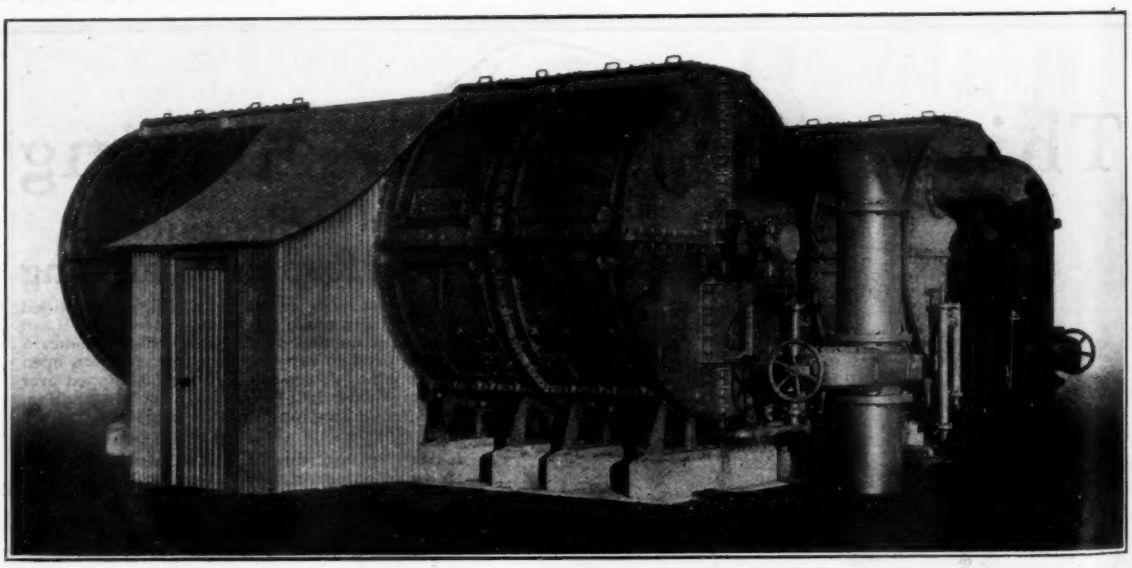
Drawing, Specification, and Tender Forms may be obtained from Mr. W. B. McLusky, Gas Engineer and Manager, Mulcture Hall Road, Halifax.

Sealed Tenders, in plain envelopes, endorsed "Tender for Benzole Plant," to be delivered to the undersigned not later than Saturday, 24th August, 1935.

The Corporation do not bind themselves to accept the lowest or any Tender.

PERCY SAUNDERS,
Town Clerk.

Town Hall,
Halifax,
July 25, 1935.



A NEW IMPORTANT FEATURE.

Dempster's Patent scrubbing medium is of light weight, thereby reducing wear on shafting—is easily removed and replaced—and eliminates all possibility of by-passing.

For the circulation of wash oil in the extraction of Benzole this improved machine ensures maximum efficiency and is equally effective for the recovery of Ammonia or elimination of Naphthalene.

R. & J. DEMPSTER LTD. MANCHESTER.

LONDON OFFICE - 34, VICTORIA ST., WESTMINSTER, S.W. 1.